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TNJPHMR

**TAMILNADU JOURNAL
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Letter from the Editor's Desk

We are very happy to bring out this particular edition of TNJPHMR to commemorate our 100 years of existence and service to the public.

DPHICON2022 – International conference on Public health is being organised to celebrate this occasion wherein more than 280 scientific articles are being presented. We are happy to create an platform for these researchers from various fields.

We are also happy to inform you that, DPH to mark its 100 years celebration, is announcing a challenge of “100 publications in 100 days” wherein we are inviting concept notes focussing on relevant public health problem , which can be publication ready in 100 days.

In this regard we propose to,

- Facilitate Access to relevant data source and facilitating data collection with adequate approval and coordination.*
- Tag each selected concept note with a senior research faculty from reputed institutions and one program officer from DPH.*
- We will ensure that, it is a team publication comprising of the selected participant, research faculty and program officer based on their contribution.*
- Support of institutional ethics committee and scientific committee at DPH and*
- Potential for publication in Tamilnadu Journal of Public Health and Medical Research (TNJPHMR)*

As per philosophy we believe that public health is empowerment of common man to handle his health issues with small technical interventions that are cost effective and accessible to majority of populations. Our articles reflect our philosophy and commitment.

Our team is continuously working to improve and reach further.

Best wishes

Dr. T.S.Selvavinayagam MD., DPH., DNB.,

Director of Public Health & Preventive Medicine

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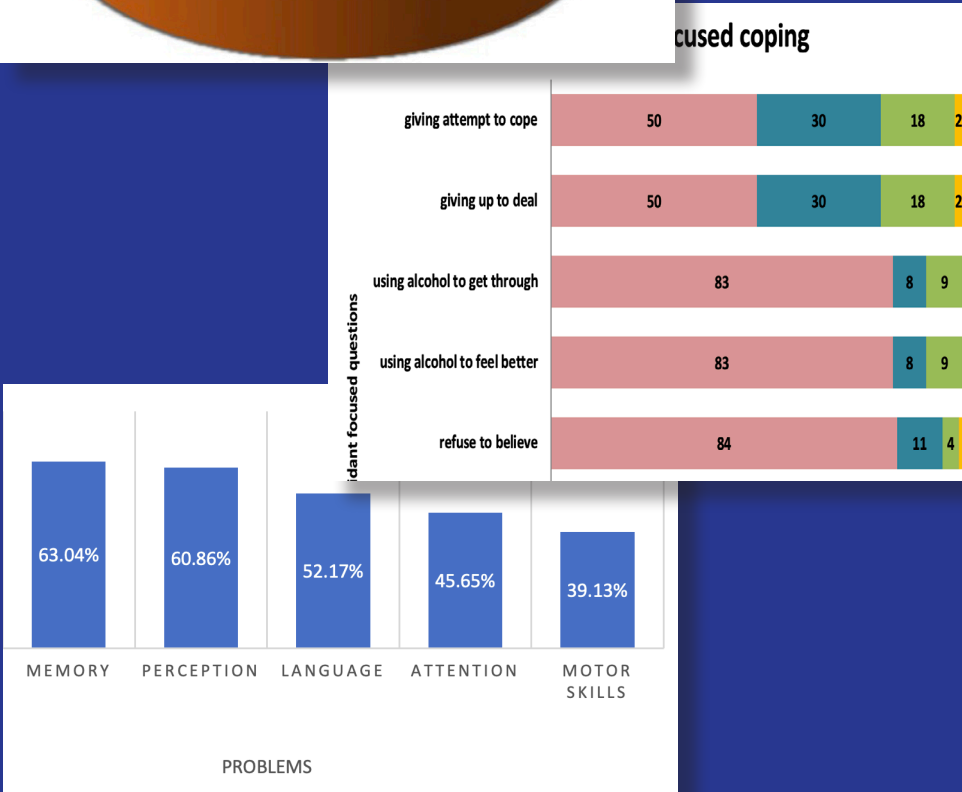
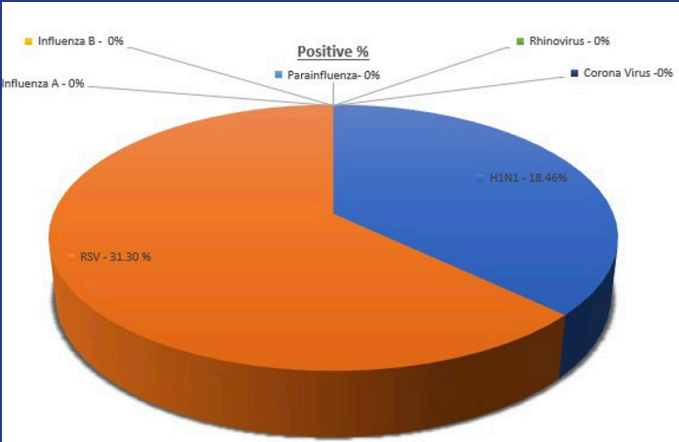
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Why do we do basic research? To learn about ourselves.



RESEARCH IS TO SEE WHAT EVERYBODY ELSE HAS SEEN, AND TO THINK WHAT NOBODY ELSE HAS

THE EFFECTIVENESS OF OCCUPATIONAL THERAPY SPATIAL PLAY-BASED MANAGEMENT ON COOPERATIVE BEHAVIOUR IN ELEMENTARY SCHOOL- AGED CHILDREN WITH AN AUTISM SPECTRUM DISORDER

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Abstract

Background : This study resources to explore the effect of Occupational Therapy Spatial Play-based Interventions on Cooperative Behaviour in Elementary School-Aged Children with a Autism spectrum disorder in a Flora occupational therapy centre in Bhavani, Tamil Nadu. Statistical tools like Descriptive statistics mean and standard deviation was utilized to analyze the effect of Occupational Therapy Spatial Play-based Interventions on Cooperative Behaviour in Elementary School-Aged Children with a Autism spectrum disorder. The analysis discovers that Occupational Therapy Spatial Play-based Interventions in Elementary School-Aged Children with a Autism spectrum disorder, and training and advancement strategy and practices of Flora occupational therapy centre. Then again, pediatric occupational therapists are satisfied with the Spatial Play-based Interventions for operational developmental coordination disorder, compensation policy, performance appraisal, and industrial relations. The analysis proposes that the clinics ought to create an appropriate Spatial Play-based strategy and give prominence to appropriate play practices to upgrade the satisfaction of their pediatric occupational therapists and construct them with Cooperative Behaviour in Elementary School-Aged Children with Autism spectrum disorder.

Key words : Spatial Play, clinics, Autism spectrum disorder, pediatric occupational therapists, Cooperative Behaviour

INTRODUCTION

The pediatric occupational therapists sector is growing at a brisk pace due to its founding of kindness services and increasing distribution by the public as well as Spatial Play-based Interventions in private clinics. The pediatric occupational therapist distribution system is characterized by major components- community and private. The Government: private-public health care system comprises limited secondary and territory care associations in key cities and emphasizes providing basic occupational therapists facilities in the form of health care centers in rural areas. The private sector provides the majority of secondary and temporary care institutions with a major concentration on Autism spectrum disorder. Existing pediatric occupational therapist establishments are expanding by opening clinics in new service areas and new societies entering with state of art equipment latest approaches and promotion strategies. Consequently, struggle along pediatric occupational therapists is on the rise increased income and awareness levels are dynamic the patients to seek quality pediatric occupational therapists. The providers in turn need to be more advanced in their approach and offer pediatric occupational therapists quality services for Autism spectrum

disorder. All this provisions the systematic Human resource Management by skilled and professional managers.

Important of pediatric occupational therapists Spatial Play-based intervention among Children with Autism spectrum disorder

Spatial Play-based intervention sessions were carried out for 20 min, four days week for 12 weeks. 30 parents per child were present during the assessments (1; 1) and 5 parent per child in rotation per session participated in the group intervention (15; 5; 2) sessions. This was done for gaining trust and compliance of parents for the child's treatment sessions. The focus in the sessions was on the spatial play. Various social-emotional skills such as salutations, turn-taking, contribution emotions, finding others, hopeful activity, focusing sustain period, following spatial, and initiating a conversation were experience using play as a



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intermediate. Activity schedule were used to reinforce the engram skill and correct behaviour. The sessions were manual recorded, and debriefing of the session was done after every assembly and it was documented.

NEED AND SIGNIFICANCE OF THE STUDY

Occupational Therapy Spatial Play-based Management on Cooperative Behaviour in Elementary School-Aged Children with an Autism spectrum disorder

These include ;

- Pediatric occupational therapists analyze Spatial Play
- Planning manpower and activity knowledgeable pediatric occupational therapists.
- Engram the developing Spatial Play-based pediatric occupational therapists.
- Evaluation Spatial Play performance and credible on an ongoing basis.
- Socializing, training, and developing Managing compensation. Communicating. Building commitment on Cooperative Behaviour in Elementary School-Aged Children with an Autism spectrum disorder.

THE FOLLOWING ONE THE PROBLEMS OF SPATIAL PLAY PRACTICES FACED BY MANY SERVICES CLINICS :

- Discovery people not contributing their play best.
- Activity configuration management.
- Failure to provide play-related preparation will eventuate undermine the department's effectiveness.

HYPOTHESIS

NULL HYPOTHESIS

There are no significant the effect of occupational therapy spatial play-based management on cooperative behaviour in elementary school-aged children with an autism spectrum disorder.

REVIEW OF LITERATURE

1.Kinkuri Sahib Kaur, Ranjit Pathak Et.al (2019) Play-based occupational therapy intervention on social skills in children with autism spectrum disorder and attention deficit hyperactivity disorder Year : 2019 | Volume : 51 | Issue : 1 | Page : 31-36

The aim of the study was to deficit in social reciprocity skills is the core underlying feature of the autism spectrum disorder. Inattention and impulsivity of attention deficit hyperactivity disorder children interferes with their ability to accurately identify, imitate, and model appropriate social

behaviours. Social skill is any skill that facilitates interaction and communication with others, and evidence suggests that they can be acquired with specific training, opportunities, and practices. Literature suggests that in a developmental approach to social skills training, play is used as the primary medium for intervention, especially with younger children.

2. Sinéad McNally Et.al (2021) A Systematic Review of Play-Based Interventions Targeting the Social Communication Skills of Children with Autism Spectrum Disorder in Educational Published: 17 August 2021

This systematic review aimed to amalgamate play-based interventions for the social communication skills of children with ASD in educational contexts and identified nine studies. Overall, studies in this review provided a promising evidence base for supporting social statement skills through play in education for children with ASD. The review also highlighted gaps in research on play-based interventions for the social communication skills of children with ASD within naturalistic educational settings.

3. Jessica R. Steinbrenner, Et.al (2021) Evidence-Based Practices for Children, Youth, and Young Adults : Published: 15 January 2021

This systematic review aimed to the selection and application of such scientifically based practices depends on the skills and wisdom of the health care worker in selecting appropriate practices for the individual and applying them with fidelity. This multi-step process of blending information about scientifically identified, efficacious practices with practitioners' knowledge and skill has been adopted in the evidence-based movements in education.

4. Michael Sherman Et.al (2006) Long-term outcome of social skills intervention based on interactive LEGO therapy. 2006 Jul;10(4):317-29

EGO building materials have been adapted as a therapeutic modality for increasing motivation to participate in social skills intervention, and providing a medium through which children with social and communication handicaps can effectively interact. A 3 year retrospective study of long-term outcome for autistic spectrum children participating in LEGO therapy (N = 60) compared Vineland Adaptive Behavior Scale socialization domain (VABS-SD) and Gilliam Autism Rating Scale social interaction subscale (GARS-SI) scores preand post-treatment with a matched comparison sample (N = 57) who received comparable non-LEGO therapy.

METHODOLOGY

The aim of the study is to determine effect of occupational

therapy spatial play-based management on cooperative behaviour in elementary school-aged children with an autism spectrum disorder

RESEARCH DESIGN :

The research design is a **Qualitative Experimental study and conducted on two groups. (Group one is occupational therapy spatial play-based management and Parent involving and Group two is Close relationship between without spatial play therapy Child)**

Pre-test and Post-test were conducted on both groups.

POPULATION

Accessible population was adapted in this study.

SAMPLING SIZE

30 subjects are included in this study.

SAMPLE TECHNIQUES

Convenient sampling technique was adapted.

STUDY PLACE

The subjects were selected from Flora occupational therapy centre, Bhavani, Tamil Nadu.

VARIABLES

Independent variables

Occupational therapy spatial play-based management

Dependent variables

Autism spectrum disorder (ASD)

INCLUSION CRITERIA

- Both genders were included.
- Subjects between 5 to 13 years were only included.
- Children with Autism spectrum disorder.

EXCLUSION CRITERIA

- Age should not be less than 5 years and more than 13 years.
- The participants were excluded if they had any other Paediatric condition such as ADHD,, LD, CP, GDD, etc.,

DURATION OF THE PERIOD

Total duration of the study was 3 months.

MEASUREMENT TOOLS

The play observation Scale (POS)

Child Sensory Profile -2 (SP-2)

Indian scale for assessment of autism (IASAA)

PROCEDURE OF STUDY

This qualitative true experimental research conducted on children with Autism spectrum disorder for 3 months. In this study, 30 children and age group between 5 to 13 years were included. Initially; permission for doing research was received from the subject's parents or caregiver by getting consent form. Then details such as name, age, sex, history

of Autism spectrum disorder was taken by using assessment form and the procedure was explained to the parents or caregiver. Pre and Post test data were collected through Child Sensory Profile – 2, The Play observation scale (POS), Indian scale for assessment of autism (IASAA) and were examined using Spatial play OT interventions. The collected data were divided into two group based on intervention. The Occupational therapy interventions plan based Activity Configuration Approach. Further, Research data were analyzed by calculating mean value, t value and p value.

DATA ANALYSIS AND RESULTS

DATA COLLECTION OR STATISTIC ANALYSIS

- This study used two groups of populations were collected the data of pre and post- intervention.
- The entire statistical test was performed using statistical package for graph pad instate software version 3.1 respectively.

Table 1 : Characteristic of data Control group and experimental group pre-evaluation -The play observation scale (POS)

Characteristic of data-Unpaired t-test	Control group pre- test evaluation (POS)	Experimental group pre-test evaluation (POS)
Mean	-9.27	-9.07
standard deviation	5.20	4.79
Sample size	15	15
standard error (SE) mean	1.34	1.24
95% confidence interval difference	-3.94	3.54

Table 1 data shows experimental and control group (POS) pre-test evaluation scores of all 30 subjects, mean values are -9.27 and -9.07, respectively standard deviation 5.20 and 4.79 respectively sample size 30, standard error of mean 1.34 and 1.24, the mean of pre control and experimental 95% confidence interval of this difference -3.94and 3.54, respectively.

Table 2 : Unpaired't' test results between Pre control and pre experimental groups of The play observation scale (POS) evaluation

S. No.	Variable 1	Variable 2	P value	t value	Level of Significance
1	Pre control group	Pre experimental group	0.9135	0.1096	Not statistically Significant

Table 2 shows that comparison between the pre-experimental and control group of The play observation scale (POS) in pre-evaluation test scores of all 30 subjects, 't' value is 0.1096 p-value is 0.9135 This difference is considered to be statistically not significant.

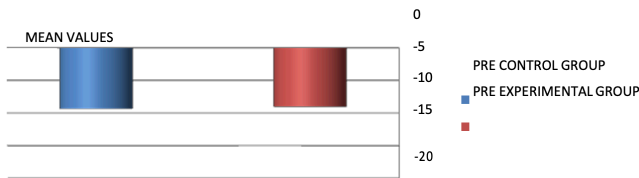


Figure 1: Mean of Pre control and pre-experimental groups of evaluation - The play observation scale (POS)

Table 3: Characteristic of data pre-control group and post control group pre-post-evaluation- The play observation scale (POS)

Characteristic of data paired t-test	POS (pre-test performance)	POS (post-test performance)
Mean	-9.27	-8.80
standard deviation	5.20	5.16
Sample size	15	15
The standard error (SE) means	1.34	1.33
95% confidence interval	-4.16	3.22

Table 3 data shows of pre control group and post control group POS pre-post-evaluation- of all 30 subjects, mean values are -9.27 and -8.80, respectively standard deviation 5.20 and 5.16 respectively sample size 30, standard error of mean 1.34 and 1.33, 95% confidence interval - 4.16 and 3.22, respectively.

Table 4 : 't' test between characteristics of data pre-control group and post control group pre-post-evaluation- The play observation scale (POS)

S. No.	Variable 1	Variable 2	P value	t value	Level of Significance
1	Control pre-test evaluation	Control post-test evaluation	0.7902	0.2712	Not statistically Significant

Table 4 shows that comparison between the pre-control group and post control group pre-post-evaluation- The play observation scale (POS) of all 30 subjects, 't' value is 0.2712 'p-value is 0.7902, This difference is considered to be statistically not significant.

Figure 2 : Mean of pre-control group and post control group pre-post-evaluation- The play observation scale (POS)

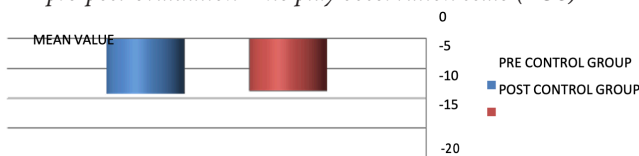


Table 5 data shows the pre-experimental group and post-experimental group pre-post- evaluation- scores of all 30 subjects, mean values are -9.07 and -2.33, respectively standard deviation 4.79 and 4.61 respectively sample size 30, standard error of mean 1.24 and 1.19, 95% confidence interval -12.75 and -10.05, respectively.

Table 5 : Characteristic of data pre-experimental group and post-experimental group ETCH-M pre-post-evaluation - The play observation scale (POS)

Characteristic of data-paired t-test	Experimental(pre-test evaluation)	Experimental(post-test evaluation)
Mean	-9.07	2.33
standard deviation	4.79	4.61
Sample size	15	15
The standard error (SE) means	1.24	1.19
95% confidence interval difference	-12.75	-10.05

Table 6 : 't' test between pre-experimental group and post-experimental group pre-post- evaluation - POS

S. No.	Variable 1	Variable 2	P value	t value	Level of Significance
1	Experimental group pre-test evaluation	Experimental group post-test evaluation	<0.0001	18.0681	Extremely Significant

Table 6 shows that comparison between the pre experimental group and post experimental group pre-post-evaluation- scores of all 30 subjects, 't' value is 18.0681 'p-value is <0.0001 This difference is considered to be statistically extremely significant.

Figure 2 : Mean of the pre-experimental group and post-experimental group pre-post- evaluation-POS

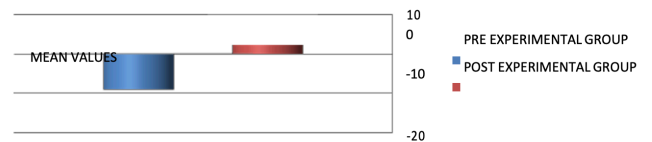


Table 7 : Characteristic of data post control and post experimental group post-evaluation- POS

Characteristic of data unpaired t-test	Post control test evaluation	post experimental test evaluation
Mean	-8.80	2.33
standard deviation	5.16	4.16
Sample size	15	15
standard error (SE) mean	1.33	1.19
95% confidence interval difference	-14.79	-7.48

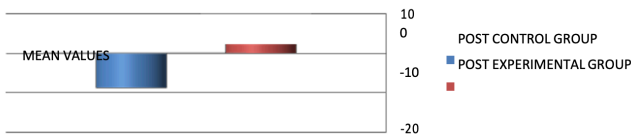
Table 7 data shows post control and post experimental group POS post-evaluation- scores of all 30 subjects, mean values are -8.80 and 2.33, respectively standard deviation 5.16 and 4.16 respectively sample size 30, standard error of mean 1.33 and 1.19, 95% confidence interval - 14.79 and -7.48, respectively.

Table 8 data shows that comparison between post control and post experimental group POS post-evaluation- scores of all 30 subject, 't' value is 6.2342 'p-value is <0.0001 This difference is considered to be statistically extremely significant.

Table 8 : 't' test between post control and post experimental group POS post-evaluation - POS

S. No.	Variable 1	Variable 2	P value	t value	Level of Significance
1	Post control test evaluation	post experimental test evaluation	<0.0001	6.2342	Extremely Significant

Graph 4 : Mean of post control and post experimental group POS post-evaluation



CONCLUSION

From the result of this study it was concluded that there is significant effect of occupational therapy spatial play-based management on cooperative behaviour in elementary school-aged children with an autism spectrum disorder. Thus, proving the alternate hypothesis and rejecting the null hypothesis. Further, that study determine effectiveness in occupational therapy spatial play-based management on cooperative behaviour in elementary school-aged children with an autism spectrum disorder.

LIMITATIONS

- The study was conducted on children with 5 to 13 years.
- The study was done on a small sample size.
- The study was conducted for shorter duration.
- The study was conducted from only one centre.

RECOMMENDATIONS

- The study can be conducted on different aged children.
- The study can be conducted on Other Paediatric conditions.

- The study can be done on mass sample size.
- The study can be conducted on multiple clinics, rehabilitation centres and hospitals.

Future studies with different epidemiological parameters for considerations of formulating the normative data.

REFERENCES

1. Kinkuri Sahib Kaur, Ranjit Pathak Et.al (2019) Play-based occupational therapy intervention on social skills in children with autism spectrum disorder and attention deficit hyperactivity disorder Year : 2019 | Volume : 51 | Issue : 1 | Page : 31-36
2. Sinéad McNally Et.al (2021) A Systematic Review of Play-Based Interventions Targeting the Social Communication Skills of Children with Autism Spectrum Disorder in Educational Published: 17 August 2021
3. Jessica R. Steinbrenner, Et.al (2021) Evidence-Based Practices for Children, Youth, and Young Adults : Published: 15 January 2021
4. Michael Sherman Et.al (2006) Long-term outcome of social skills intervention based on interactive LEGO therapy. 2006 Jul;10(4):317-29
5. Mark E. Feinberg et al., Impact of the COVID-19 Pandemic on Parent, Child, and Family Functioning, Family Process, 2021 Family Process Institute, doi: 10.1111/famp.12649
6. Galeti FS et al., How to Help Children and Adolescents with Autism Spectrum Disorder during Covid-19 Pandemic, Journal of Psychology and Neuroscience, 2020

A CROSS-SECTIONAL STUDY OF THE VIRAL ETIOLOGICAL CORRELATES IN CHILDREN PRESENTING WITH ACUTE UPPER RESPIRATORY TRACT INFECTION

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Abstract

BACKGROUND : Acute respiratory tract infection (ARI) amounts to 69% of communicable diseases with 41,996,260 cases reported in the year 2018 in India. Acute upper respiratory infection (AURI) alone accounts for 85-88% of ARI cases globally and is one of the most common childhood illnesses with mostly an acute, self-limited course. The objective of the study was to identify the prevalence of viral AURI in pediatric age group of 2-12 years, identify the common causative viruses in the region of study and to correlate them clinically as a high volume of paediatric patients coming to the opd presented with symptoms of AURI.

METHODS : A cross-sectional out-patient department (OPD) based study was conducted in Basic emergency Obstetric and Newborn care services (BEmONC) centre in Adyar, Chennai for a short period from 16th September, 2022 to 24th September, 2022 with a total sample size of 65. Children in between the age group of 2 completed years to 12 completed years who presented to the OPD with symptoms of fever, cough and rhinorrhoea for a period of 5 days or more but less than 14 days suspected to be of viral etiology were included in the study. Demographic data, clinical features, basic blood reports were recorded. Oropharyngeal swabs were collected and were transported in Viral Transport Medium (3ml) . They were tested for Respiratory Syncytial Virus (RSV), Influenza, Parainfluenza, Adenovirus and Coronavirus by nucleic acid amplification. The results were statistically analysed .

RESULTS : A total of 65 children with URTIs were included. Majority (53.8%) were males and 2-5 years of age (63.1%). Common manifestations of URTI were fever (100%), cough (79%), rhinorrhoea (62%), pharyngitis (79%) and conjunctivitis (12.3%). None (100%) of them vaccinated for Flu vaccine. Oropharyngeal swabs showed 18.46% positivity for Influenza H1N1 and 31.3% for RSV. Majority (81.54%) of children were given supportive treatment and 18.46% received Oseltamivir. Antibiotics were started empirically in 27.69%. Most of children (76%) recovered within one week and 100% within two weeks. No children were hospitalized and children positive for HINI were isolated at home for 7 days. Complications or deaths did not occur.

CONCLUSION : Majority of URTIs in children resolved with supportive treatment and do not require antibiotics. Prevention of influenza infection through vaccination is the best strategy to reduce its disease burden and high rates of School absenteeism.

KEY MESSAGES : Acute upper respiratory tract infection, Respiratory Syncytial Virus, Influenza, Flu Vaccine

INTRODUCTION

Acute respiratory tract infection (ARI) amounts to 69% of communicable diseases with 41,996,260 cases reported in the year 2018 in India. ¹ It is a significant cause of under 5 Mortality in India and a cause of school absenteeism in school going children. ARI accounts for 20% for deaths in paediatric age group under 5 years of age of which 35-40% is due to neonatal pneumonia globally.² Acute upper respiratory infection (AURI) alone accounts for 85-88% of ARI cases globally.³

Acute upper respiratory infection (AURI) is a symptom cluster consisting of but not limited to sore throat, cough, low-grade fever, nasal congestion, running nose and malaise. It is the invasion of the upper respiratory tract mucosa, usually by bacteria and virus from inhaled infected droplets, overpowering the mechanical barriers of the innate immune system such as the epithelial cilia and the mucus layer result as well as the adenoids and tonsils cause inflammation and

irritation of mucosa resulting in this symptom complex.⁴ Viral causes of ARI predominantly include human respiratory syncytial virus (RSV), human rhinovirus, influenza virus (subtypes A and B), human parainfluenza, human adenovirus and human metapneumovirus.¹

The number of community-based studies done in India is significantly less despite the high volume of cases. This leads to a chain of problems such as antibiotic abuse, stagnancy of vaccination programs and many more.⁵

AIMS AND OBJECTIVES

The objective of the study was to identify the prevalence of viral AURI in paediatric age group of 2-12 years, identify



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the common causative viruses in the region of study and to correlate them clinically as a high volume of paediatric patients coming to the OPD presented with symptoms of AURI.

MATERIALS AND METHODS

STUDY TYPE : This study is a cross-sectional descriptive study.

STUDY AREA, STUDY POPULATION AND SAMPLE SIZE : A cross-sectional out-patient department (OPD) based study was conducted in Basic emergency obstetric and newborn care services (BEmONC) centre in Chennai, Tamil Nādu for a short period from 16th September, 2022 to 24th September, 2022. The sample size obtained was 65.

INCLUSION CRITERIA :

- Children in the age group of 2 to 12 years.
- Clinical presentation of fever, cough, rhinorrhea, myalgia and headache for a period of 5 days or more but less than 14 days.

EXCLUSION CRITERIA :

- Patients presenting with chronic lung disease, heart diseases, liver disease, kidney disease, pulmonary tuberculosis, pneumonia (clinically or radiologically confirmed)
- Patients tested positive for covid.

STUDY TOOL AND DATA COLLECTION : A pretested semi-structured questionnaire was used to interview the child's mother, who was the informant in the study. The data were collected from mothers of Children in between the age group of 2 to 12 years who presented to the OPD with symptoms of acute upper respiratory tract infection visiting the Basic emergency obstetric and newborn care services (BEmONC) Centre. Data were collected for a period of 9 days from 16th September 2022 to 24th September, 2022.

STUDY DESIGN : After obtaining relevant history and a performing a detailed clinical examination, throat swabs of the patients were obtained under aseptic conditions. The samples were transported in INSTA XPORT Viral Transport Medium (3ml). Swabs in VTM was shifted at 2°C-8°C on wet ice within a period of 6 hours from collection for testing. The samples were tested for Respiratory Syncytial Virus (RSV), Influenza, Para influenza, Adenovirus and Rhinovirus. The complete blood count and C-Reactive protein value reports of participants were collected.

STATISTICAL ANALYSIS : The data analysis was carried out using SPSS for Windows, version 17.0. Continuous variables were presented as mean \pm SD. Categorical variables were expressed as frequencies and percentages. The significance level was set at $P < 0.05$.

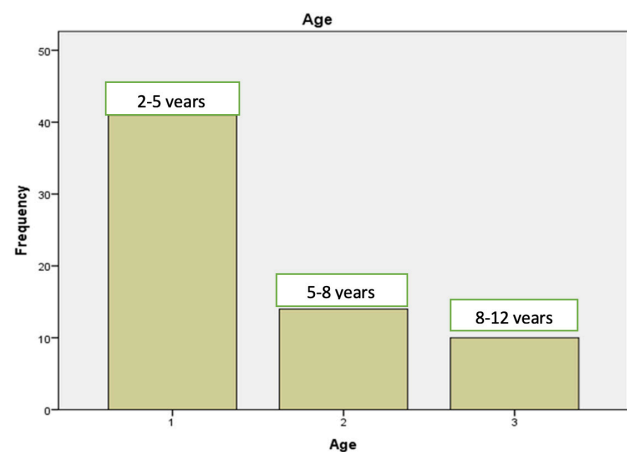
ETHICAL APPROVAL, INFORMED CONSENT, AND SUPPORT:

The study was carried out after obtaining approval from the Institutional Ethics Committee. The parents were briefed about the study, and informed consent was obtained before data collection. As part of the logistics support, the materials, manpower, and other resources required for conducting the study was provided by the institution.

RESULTS

A total of 65 children with URTIs were included. Majority (53.8%) were males and 2-5 years of age (63.1%). Common manifestations of URTI were fever (100%), cough (79%), rhinorrhoea (62%), pharyngitis (79%) and conjunctivitis (12.3%) (Figure 1). Only 1.5% had history of contact with URTI in a family member and none of them vaccinated for Flu vaccine.

Figure 1 : Agewise prevalence of AURI



Among the children studied 6.1% had auscultatory finding of crepitations or wheeze in chest. Among the blood investigations, CRP was positive in 16.9% of children (Figure 2).

Table 1 : Frequency of symptoms in AURI

Symptoms	Percentage (actual number of patients)
Fever	100% (65)
Cough	79% (51)
Sore throat/throat pain	79% (51)
Nasal discharge	62% (40)
Conjunctivitis	12.3% (8)
Ear ache/discharge	6.5% (4)

Oropharyngeal swabs showed 18.46% positivity for Influenza H1N1 and 31.3% for RSV (Figure 3).

Majority (81.54%) of children were given supportive treatment and 18.46% received Oseltamivir. Antibiotics were started empirically in 27.69%. Most of children (76%) recovered within one week and 100% within two weeks. No children were hospitalized and children positive for HINI were

isolated at home for 7 days. Complications or deaths did not occur.

Figure 2 : Prevalence of Positive CRP in AURI
key: 1- positive ; 2- negative

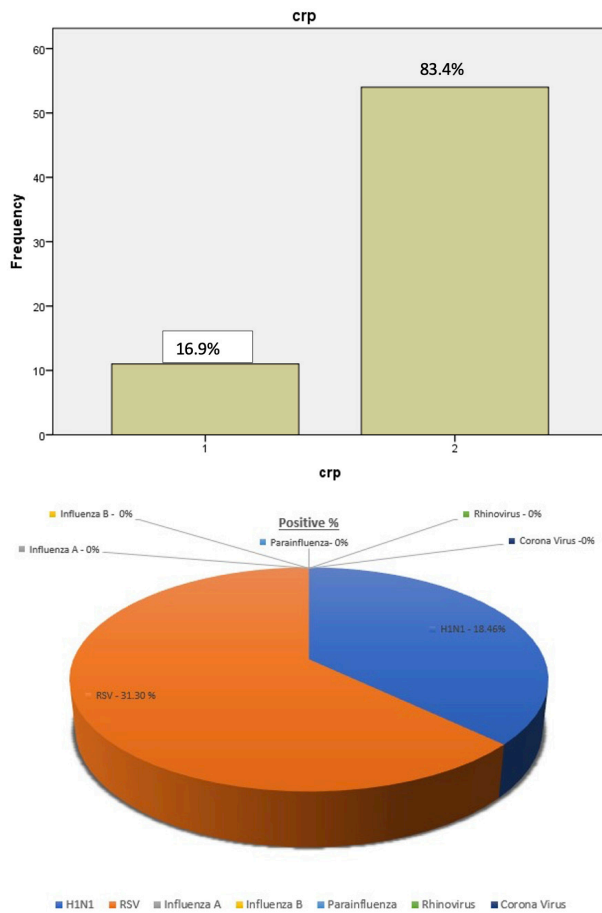


Figure 3: Pie chart representing the percentage of individual virus tested positive in study population

DISCUSSION

The study demonstrated higher proportion of boys (53.8%) was reported to have AURI when compared to girls (%). The association between gender and AURI is statistically significant. Various studies carried out by Choube et al., Prajapati et al., Goel et al., and Leeder et al. report that male children are more prone to ARI when compared to female children.^{6,7,8}

The probable reason that there is predominance among male children could be because of the tendency of male children to play outside home getting them exposed to infected aerosols from the surrounding outdoor environment as compared to female children.

In our study, children between the age group of 2-12 years were selected. Children below 2 years of age frequently suffer from bronchiolitis with RSV being the most common etiological agent detected in clinical practice. Children >12 years compromise small proportion of study population in our OPD, hence not included in our study. In our study, the most

common viruses detected were RSV followed by H1N1 Influenza. The age distribution of ARIs indicated that children under 3 years old were more likely to be infected by RSV confirmed the importance of RSV in children with ARIs, especially in children < 4 years of age.⁹⁻¹² Influenza virus is one of the major causative agents of respiratory disease in humans and may lead to serious illness.¹³ In temperate countries influenza outbreaks usually occur during the winter season.

With the introduction of molecular techniques, the detection of multiple co-infecting viruses has become common, though the prevalence of each virus varies between studies.¹⁴

Although our study didn't show any co-infection, previous reports suggest the incidence of viral co-infection in children can reach 30%.¹⁵ Co-infection is most often found in children under the age of 5, due to the immaturity of the immune system and, thus, greater susceptibility to infection.¹⁶

LIMITATIONS

Limitations of the study was convenient sampling. Due to diversity of population in different parts of India and their living conditions, it is difficult to generalize these findings. Further, quantification of other related risk variables like overcrowding, area of residence and nutrition status could not be included in our study due to feasibility constraints. Since our study was performed in a shorter duration, effect of seasonality could not be studied. Further longitudinal multicentric studies will help in identifying the association with risk factors.

CONCLUSION

- Majority of URTIs in children resolved with supportive treatment and do not require antibiotics. Antibiotic stewardship in simple URTIs should be practiced using awareness.
- Prevention of influenza infection through vaccination is the best strategy to reduce its disease burden and high rates of School absenteeism.
- The Flu Vaccination may also have a protective effect on the course of COVID-19 in the Paediatric Population.
- Such studies are important for the improvement and optimization of diagnostic tactics, as well as measures for the control and prevention of the respiratory viral infections.

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REFERENCES

1. V; WRJSN. The burden of respiratory viruses and their prevalence in different geographical regions of India: 1970-2020 [Internet]. *Frontiers in microbiology*. U.S. National Library of Medicine; [cited 2022Nov14]. Available from: <https://pubmed.ncbi.nlm.nih.gov/34531842/>
2. Wardlaw TM, Johansson EW, Hodge MJ. UNICEF; 2006. [Last accessed on 2013 Mar 13]. World Health Organization. Pneumonia: The Forgotten Killer of Children. Available from: http://www.who.int/maternal_child_adolescent/documents/9280640489/en .
3. Krishnan A, Amarchand R, Gupta V, Lafond KE, Suliankatchi RA, Saha S, et al. Epidemiology of acute respiratory infections in children - preliminary results of a cohort in a rural North Indian Community - *BMC infectious diseases* [Internet]. BioMed Central. BioMed Central; 2015 [cited 2022Nov14]. Available from: <https://bmcinfectdis.biomed-central.com/articles/10.1186/s12879-015-1188-1>
4. Upper Respiratory Tract Infection - StatPearls - NCBI Bookshelf [Internet]. [cited 2022Nov14]. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK532961/>
5. elvaraj K, Chinnakali P, Majumdar A, Krishnan IS. Acute respiratory infections among under-5 children in India: A situational analysis [Internet]. *Journal of natural science, biology, and medicine*. U.S. National Library of Medicine; 2014 [cited 2022Nov14]. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3961922/>
6. Choube A, Kumar B, Mahmood SE, Srivastava A. Potential risk factors contributing to acute respiratory infections in under five age group children. *Int J Med Sci Public Health*. 2014;3:1385–8.
7. Prajapati B, Talsania NJ, Lala MK, Sonalia KN. Epidemiological profile of Acute Respiratory Infections (ARI) in under five age group of children in urban and rural communities of Ahmedabad district, Gujarat. *Int J Med Sci Public Health*. 2012;1:52–8.
8. Goel K, Ahmad S, Agarwal G, Goel P, Kumar V. A cross sectional study on prevalence of Acute Respiratory Infections (ARI) in under-five children of Meerut district. India. *J Community Med Health Educ*. 2012;2:2161–5.
9. Do AH, van Doorn HR, Nghiem MN, Bryant JE, Hoang TH, Do QH, et al. Viral etiologies of acute respiratory infections among hospitalized Vietnamese children in Ho Chi Minh City, 2004–2008. *PLoS One*. 2011. March 24; 6(3): e18176 10.1371/journal.pone.0018176
10. He Y, Lin GY, Wang Q, Cai XY, Zhang YH, Lin CX, et al. A 3-year prospective study of the epidemiology of acute respiratory viral infections in hospitalized children in Shenzhen, China *Influenza Other Respir Viruses*. 2014. July; 8(4):443–51. 10.1111/irv.12257 Epub 2014 May 14;
11. Gurgel RQ, Bezerra PG, Duarte Mdo C, Moura AA, Souza EL, Silva LS, et al. Relative frequency, Possible Risk Factors, Viral Codetection Rates, and Seasonality of Respiratory Syncytial Virus Among Children With Lower Respiratory Tract Infection in Northeastern Brazil. *Medicine (Baltimore)*. 2016. April; 95(15): e3090 10.1097/MD.0000000000003090
12. Homaira N, Luby SP, Hossain K, Islam K, Ahmed M, Rahman M, et al. Respiratory Viruses Associated Hospitalization among Children Aged < 5 Years in Bangladesh: 2010–2014. *PLoS One*. 2016. February 3;11(2): e0147982 10.1371/journal.pone.0147982 eCollection 2016;
13. Eccles R. Understanding the symptoms of the common cold and influenza. *Lancet Infect Dis*. 2005. November; 5(11):718–25; 10.1016/S1473-3099(05)70270-X
14. Cebey-López M, Herberg J, Pardo-Seco J, Gómez-Carballa A, Martín-Torres N, Salas A, et al. Viral Co-Infections in Pediatric Patients Hospitalized with Lower Tract Acute Respiratory Infections. *PLoS One*. 2015. September 2; 10(9): e0136526 10.1371/journal.pone.0136526 eCollection 2015;
15. Asner SA, Science ME, Tran D, Smieja M, Merglen A, Mertz D. Clinical Disease Severity of Respiratory Viral Co-Infection versus Single Viral Infection: A Systematic Review and Meta-Analysis. *PLoS One*. 2014. June 16; 9(6): e99392 10.1371/journal.pone.0099392 eCollection 2014;
16. Huo X, Qin Y, Qi X, Zu R, Tang F, Li L, et al. Surveillance of 16 respiratory viruses in patients with influenza-like illness in Nanjing, China. *J Med Virol*. 2012. December; 84(12):1980–4. 10.1002/jmv.23401

A CROSS SECTIONAL STUDY ON KNOWLEDGE OF BREASTFEEDING AND DETERMINANTS OF PRELACTEAL FEEDING PRACTICES AMONG MOTHERS OF INFANTS IN A RURAL AREA OF TAMILNADU

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Abstract

BACKGROUND : Globally, the Neonatal Mortality Rate was 17 deaths per 1,000 live births in 2019. In India, it was 22 deaths per 1000 live births. Neonatal deaths contribute a greater proportion of Infant and Under 5 mortality rate. The care during this period is very critical for the growth and development of the child. Breastfeeding is one of the important aspect of essential newborn care.

METHOD : The Community based Cross sectional study was conducted among 110 Postnatal mothers of villages in Vellore district. Study duration was from August 2020 to December 2021. Questionnaire regarding Knowledge of Breastfeeding and Determinants of Pre-lacteal feeding practices was administered and responses were obtained.

RESULTS : About 55% of the participants belonged to joint family, 52% had completed high school education, 45% belonged to Upper Lower Class(Class IV) according to B.G.Prasad scale. 99% had institutional delivery. About 57% of the mothers considered the first hour of birth as the best time to initiate breastfeeding. 43% had poor knowledge regarding breastfeeding. 13% practiced prelacteal feed, the commonest are sugar water and honey.

CONCLUSION : The knowledge regarding initiation of breastfeeding, duration of exclusive breastfeeding, start of complementary feed and ill-effects of prelacteal feeding was not adequate. Advise to both mothers and their family members are needed for appropriate feeding of the newborn.

KEY WORDS : Breastfeeding, Essential Newborn Care, Prelacteal Feeding Practices, Postnatal Mothers

INTRODUCTION

A Newborn is called as a neonate in the first 4 weeks of life, after birth. Globally, the Neonatal Mortality Rate is 17 deaths per 1,000 live births in 2019, much higher than the Infant Mortality Rate & Under 5 Mortality Rate which is 11 and 10 deaths per 1000 live births respectively. About a third of all neonatal deaths occurs within the first day after birth. Neonatal deaths accounts for 47 per cent of global Under-five deaths in 2019.¹

In India, by the year 2019, the Neonatal Mortality Rate was 22 deaths per 1000 live births. The Infant Mortality Rate & Under 5 Mortality Rates are 28 & 34 deaths per 1000 live births respectively.² Neonatal deaths contribute a greater proportion of Infant and Under 5 mortality rate. The care during this period is very critical for the growth and development of the child.

The Essential Newborn Care (ENBC) includes: Thermal protection (e.g. promoting skin-to-skin contact between mother and infant), Hygienic umbilical cord and skin care, Early and exclusive breastfeeding, Assessment for signs of serious health problems or need of additional care (e.g. those that are low-birth-weight, sick or have an HIV-infected mother), Preventive treatment (e.g. immunization BCG and Hepatitis B, vitamin k and ocular prophylaxis).³ Though all of them are important, Breastfeeding gives children the healthiest

start in life.⁴ Exclusive breast feeding is given for first 6 months of life. Maternal knowledge was a critical factor, with higher knowledge of breastfeeding being associated with a three- to four-fold increase in Early initiation of breastfeeding as per a study in Uttar Pradesh.⁵

Any fluid or feed given before breastfeeding initiation is called as Pre-lacteal feeds.⁶ Several cultural factors are associated with breastfeeding and Pre-lacteal feeding practices. In Hindus - Megha janan (literal meaning- production of intelligence) is performed during the Jatkarma (child welcoming ceremony), in which the father gives honey or pure ghee to the child and whispers mantras in to infant's ear.⁷ Tahneek-In Muslims, soon after birth, before the first feed, a piece of softened date is rubbed into upper palate. when dates is not available, honey may be used. It is with a belief that the rubbing person's positive attributes will be transmitted to the infant.⁸

According to a study in Uttar Pradesh, the most common prelacteal feeds given were cow/goat milk followed by honey



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and infant formula.⁵ In a study at rural areas of North India, Post natal mothers of younger age, belonging to higher castes or SES and who had home deliveries were found to be more likely to adopt the practice of prelacteal feeding for their children.⁹

OBJECTIVE

1.To assess the Knowledge of Breastfeeding among mothers of infants.

2.To determine the various factors influencing the Pre-lacteal feeding practices among mothers of infants.

METHODOLOGY

This Community based Cross sectional study was conducted among Postnatal mothers in Vellore, after getting ethical clearance from Institutional Ethics Committee, Madras Medical College and permission from the Deputy Director of Health Services, Vellore Health Unit District. Study duration was from August 2020 to December 2021. Using the prevalence value of 48.3%, (According to NFHS-4, 48.3% of mothers in Tamilnadu practiced exclusive breastfeeding to their children), α at 5% significance level and an absolute precision of 10%, Sample size was calculated using the formula $n = Z^2pq/d^2$. The sample size was estimated to be 96. Adding 10 % for non response rate, the minimum sample size required was derived to be 110.

By Multistage Sampling, Out of 42 Health Unit Districts (HUD), Vellore HUD was selected. In Vellore HUD, Out of 4 blocks Anaicut block was selected. In Anaicut block, among 4 PHCs, Pallikonda PHC was selected by simple random sampling. In Pallikonda PHC, Post natal mothers belonging to all the 11 subcenters were selected by Proportional stratified sampling method.

Postnatal mothers of children less than 1 year of age and those who are staying in the area for atleast 6 months were included. After getting informed consent, a pre-tested, pre-designed semi structured questionnaire regarding Knowledge of Breastfeeding and Determinants of Pre-lacteal feeding practices were administered. The data collected were coded and entered in MS Excel. Using SPSS Version 23, appropriate Descriptive and Inferential statistics were applied.

RESULTS

About 55% of the participants belonged to joint family, 52% had completed high school education, 45% belonged to upper lower class(class IV) according to B.G.Prasad scale and 91% of them were Hindus.

Table 1 : Socio demographic characteristics of the participants (n=110)

S.No	Socio demographic characteristics	N (n=110)	%
1	Type of family:		
	Nuclear family	48	44
	Joint family	61	55
	Three generation family	1	1
2.	Educational qualification of mothers:		
	Primary	6	6
	Middle school	11	10
	High school	35	31
	Higher secondary	30	27
	Diploma	10	9
	Degree	18	16
3.	Occupational status of mothers:		
	Unemployed	57	52
	employed	53	48
4.	B.G.Prasad's scale :		
	Class I	3	3
	Class II	9	8
	Class III	28	25
	Class IV	50	45
	Class V	20	18
5.	Religion:		
	Hindu	100	91
	Muslim	10	9

About 59% of the mothers were of second parity, 89% of them delivered babies of weight above 2.5kgs, 99% had institutional delivery and the Mode of last delivery was labour Natural labour for 68% of the participants.

Table 2: Parturition details of the study participants(n=110)

S.No	Parturition details	N (n=110)	%
1.	No of children:		
	1 child	45	41
	More than 1 child	65	59
2.	Birth weight of the last baby:		
	1.5 -2.5 kg	11	10
	2.5- 3.5 g	65	59
	> 3.5 kg	34	30
3.	Gender of the last born baby:		
	Male	59	53
	Female	50	1
	Both (twins)	1	44
4.	Place of last delivery:		
	Institution	109	98.2
	108	1	0.9
5.	Mode of last delivery:		
	Labour natural	74	67.3
	Caesarean section	36	32.7

About 57% of the mothers considered the first hour of birth as the best time to initiate breastfeeding. About 67%, considered crying as the only cue to breastfeed the baby. 89% responded that breastfeeding can be done during illness and after immunisation. 70% knew about breastfeeding from health care personnel.

Table 3: Knowledge of the participants regarding breastfeeding (n=110)

S.No	Knowledge regarding breastfeeding	N (n=110)	%
1.	Best time to initiate breast feeding: Less than 1 hour of birth	63	57
2.	Is it correct to give colostrum? Yes	104	95
3.	Cues of breastfeeding: Baby is crying Stretching the body Bringing hands to mouth Suckling action Increased activity (Multiple responses were allowed)	74 5 35 14 6	66.7 5 32 13 5
4.	Exclusive breastfeeding is continued till: 6 months	71	64
5.	Frequency of breastfeeding in a day: 8-10 times	75	68
6.	Along with breastmilk, Complementary feed can be given from: 6 months onwards	102	93
7.	Breastfeeding can be continued till when 2 years	46	43
8.	Breastfeeding is considered as sufficient: Adequate weight gain Baby Urinates > 6 times a day Both	52 12 45	46 11 43
9.	Can the baby be breastfed during illness and after immunisation: Yes	98	89
10.	It is essential to breastfeed the baby because Breastmilk is nutritious to the baby Acts as immune booster Improves IQ of the baby all	10 23 1 75	9 20 0.9 68
11.	Benefits to the mother for breastfeeding the baby: Prevents Cancer breast/ postpones next pregnancy/helps uterus to involute/ controls Post-Partum bleeding	73	66
12.	Food habits of the mother: Nutritious food and no diet restriction	105	95
13.	Knew about breastfeeding from: Relative Health care personnel	33 77	30 70
14.	Is it good to give prelacteal feed: Yes no	15 95	13 87

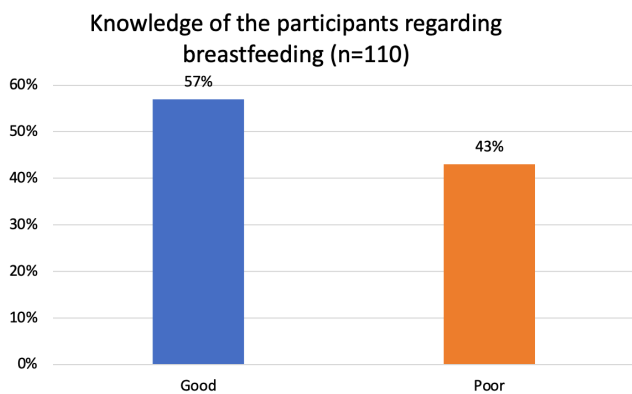


Figure 1: Knowledge scores of the participants about breastfeeding (n=110)

There is no significant difference between the percentage of participants who had good and poor knowledge scores regarding breastfeeding.

About 87 % of mothers breastfed their baby within 1 hour of birth. Colostrum was given to newborn by 96% of the mothers. 13% practiced prelacteal feed, the commonest being sugar water and honey.

Table 4: Breastfeeding and Pre-lacteal feeding Practices of the participants (n=110)

S.No	Breastfeeding and Pre-lacteal feeding Practices	N (n=110)	%
1.	Breastfed the baby within 1 hour of birth: Yes No (caesarean section, baby was in NICU, Breastmilk was inadequate)	97 12	87.4 10.8
2.	Colostrum was given to the baby: Yes No (colostrum is bad for health/ discarded due to the compulsion of others)	106 4	96 3
3.	Newborn was given Prelacteal feed: Yes no	13 96	12.7 86.3
4.	The Prelacteal feed given was: Sugar water Honey Animal milk	6 6 1	5.4 5.4 0.9
5.	Prelacteal feed was given because: Good for health To get rid of evil eye	1 12	1 11
6.	Prelacteal feed was given on whose decision: My Own decision Relative' decision (grandmother)	2 11	2 10

Table 5: Association between age, Socio economic status, number of living children, Educational status of the participants and Prelacteal feeding practices (n=110)

Characteristics		Age of the participants		B.G.Prasad scale		No. of living children		Educational status of the participants	
		< 25 years	> 25 years	Upper & middle class	Lower class	1	More than 1	12 th standard	Degree/ Diploma
Pre lacteal feed given	Yes	7 (11%)	6 (15%)	6 (15%)	8 (12%)	4 (9%)	10 (15%)	8 (10%)	5 (18%)
	No	60 (89%)	36 (85%)	34 (85%)	62 (88%)	41 (91%)	55 (85%)	73 (90%)	23 (82%)

P value > 0.05

There is no significant association between age, Socio economic status, number of living children, Educational status of the participants and Prelacteal feeding practices among them

Table 6 : Association between mode of last delivery, knowledge of breastfeeding of the participants and Prelacteal feeding practices(n=110)

Characteristics		Age of the participants		B.G.Prasad scale		No. of living children		Educational status of the participants	
		< 25 years	> 25 years	Upper & middle class	Lower class	1	More than 1	12 th standard	Degree/ Diploma
Pre lacteal feed given	Yes	7 (11%)	6 (15%)	6 (15%)	8 (12%)	4 (9%)	10 (15%)	8 (10%)	5 (18%)
	No	60 (89%)	36 (85%)	34 (85%)	62 (88%)	41 (91%)	55 (85%)	73 (90%)	23 (82%)

P value > 0.05

There is no significant association between mode of delivery, knowledge of the participants about breastfeeding of the participants and prelacteal feeding practices among them.

DISCUSSION

This Community based Cross sectional study was conducted among Postnatal mothers of a rural area in Vellore district, Tamilnadu. The study was done to assess the Knowledge of Breastfeeding and Determinants of Pre-lacteal feeding practices among the postnatal mothers of infants.

In our study, majority of the participants (91%) belonged to Hindu religion which is similar to a study done at Uttar Pradesh by young et al.¹⁵ Majority (45%) of the study participants belonged to class IV, B.G.Prasad scale whereas in a study by M.P.Roy et al⁹ majority were from (25.9%) class IV. 52% of the participants were house wives which is lower when compared to a study done by Shalini et al (95%)¹⁰

The mode of delivery was labour natural in 67% of the participants which is much higher compared to a study by Shalini et al¹⁰ where it was 48%. This is attributed to the place of study while the present study was done at rural area but the later was done at urban Chennai. In our study, 98% of the participants had institutional delivery which is comparable with a study by M.P.Roy et al⁹ where it was around 85%. This signifies the greater utilisation of health services by the mothers. In our study majority (88%) of the participants had delivered babies of weight >2.5 kg which is similar to a study by Shalini et al at Chennai(78%).¹⁰

In our study, majority of the participants (70%) Knew about breastfeeding from health care workers which is evident from the fact that most of the deliveries were institutional, followed by relative as a source for 30% of mothers which is in contrast with a study by Sultania P et al¹¹ where it was 35% and 65% respectively. In our study, breastmilk is considered as nutritious by 68% of the participants while it was 64% in a study by Sultania P et al.¹¹ In our study, breastfeeding prevents conception was known by 66% of the participants which is very lower in a study by Sultania P et al(14%).¹¹ In our study, 57% and 13% of the participants considered that breastfeeding should be initiated within 1 hour of birth & thought that prelacteal feeding was good which is comparable to a study by Mermon et al¹² where it was 54% & 42% respectively. In our study colostrum was considered as good to baby by 95% of the participants which is higher compared to a study by Mermon et al¹² where it was 56%.

In our study, 87 % of mothers practiced early initiation of breastfeeding which is similar to a study done by Aritra Das et al¹³ in Bihar where it was around 82% and 45% in a study by Sulatnia P et al.¹¹ In our study, colostrum was fed by 96% of mothers which is similar to a study done by Sulatnia P et al¹¹ where it was 82%. In our study prelacteal feeding was practised by 13% of the participants which is

much lower compared to a study by Shalini et al¹⁰ where it was 19%, 26% in a study by Aritra Das et al¹³ in Bihar, 27% in a study by Sulatnia P et al¹¹ and 88% in a study by Mengi et al¹⁴ at Jammu & Kashmir. In our study, Among the mothers practising prelacteal feeding, the commonest prelacteal feed given was honey and sugar (50%) which is similar to studies by Mengi et al¹⁴ at Jammu & Kashmir and 25% in a study by Shalini et al.¹⁰ In our study animal milk was given by 1 % mothers which is lower compared to a study in Chennai.¹⁰

The influence of religion, parity, education, or family type on prelacteal feeding was not prominent in our study which is similar to a study by M.P.Roy.⁹

CONCLUSION

Majority of the study participants belonged to joint family, low socio economic status and had completed high school education. A greater proportion of participants had institutional delivery, delivered babies of normal weight which contributes to the awareness and utilisation of health services.

Knowledge regarding colostrum, benefits of breastfeeding to baby and mother, breastfeeding in special situation like illness was adequate but the knowledge regarding initiation, frequency, cues of breastfeeding, duration of exclusive breastfeeding, start of complementary feed and regarding prelacteal feeding was not adequate. Thus the difference in proportion of participants with good and poor knowledge is not much significant.

Though majority of the participants, had practiced early initiation of breast feeding and colostrum feeding, few participants fed prelacteal feeds to their babies either, on compulsion of others. Harmful effects of prelacteal feeds should be advised to both mothers and their family members to overcome this practice.

LIMITATIONS

The study didn't cover the entire villages of the Anaicut Block, hence a overall view could not be obtained. The study was done in rural areas hence, the state of urban areas are not known. As the Child rearing is a combined responsibility of the mother and her family, the study failed to assess the awareness of husbands and grandparents regarding newborn care.

REFERENCES

1. Neonatal mortality - UNICEF DATA [Internet]. UNICEF DATA. 2021 [cited 10 November 2021]. Available from: <https://data.unicef.org/topic/child-survival/neonatal->

mortality/

2. India (IND) - Demographics, Health & Infant Mortality - UNICEF DATA [Internet]. UNICEF DATA. 2019 [cited 10 November 2021]. Available from: <https://data.unicef.org/country/ind/>

3. Newborn care - UNICEF DATA [Internet]. UNICEF DATA. 2021 [cited 22 December 2021]. Available from: <https://data.unicef.org/topic/maternal-health/newborn-care/>

4. Breastfeeding [Internet]. UNICEF. 2020 [Accessed on 2nd December 2020]. Available from: https://www.unicef.org/nutrition/index_24824.html

5. Young M, Nguyen P, Kachwaha S, Tran L, Ghosh S, Agrawal R et al. It Takes a Village: an Empirical Analysis of How Husbands, Mothers-in-law, Health Workers and Mothers Influence Breastfeeding Practices in Uttar Pradesh, India (P10-149-19). Current Developments in Nutrition. 2019;3(Supplement_1).

6. BFHI_Revised_Section_3.2.PDF Section 5, Pg no-94 [Internet]. [Accessed on 2nd December 2020]. Available from: https://www.who.int/nutrition/topics/BFHI_Revised_Section_3.2.pdf

7. 4. Laroia N, Sharma D. The Religious and Cultural Bases for Breastfeeding Practices Among the Hindus. Breastfeeding Medicine. 2006;1(2):94-98.

8. 5. GATRAD A. Muslim birth customs. Archives of Disease

in Childhood - Fetal and Neonatal Edition. 2001;84(1):6F-8.

9. Roy, Manas Pratim et al. "Determinants of prelacteal feeding in rural northern India." International journal of preventive medicine vol. 5,5 (2014): 658-63.

10. S. S, Gopalakrishnan S. Breastfeeding practices of nursing mothers in Tamil Nadu: a hospital based cross sectional study. International Journal of Community Medicine And Public Health. 2018 Sep 24;5:4441.

11. Sultania P, et al. Breastfeeding Knowledge and Behavior Among Women Visiting a Tertiary Care Center in India: A Cross-Sectional Survey. Annals of Global Health. 2019; 85(1): 64, 1-9. DOI: <https://doi.org/10.5334/aogh.2093>

12. Memon J, Holakouie-Naieni K, Majdzadeh R, Yekaninejad MS, Garmaroudi G, Raza O, et al. Knowledge, attitude, and practice among mothers about newborn care in Sindh, Pakistan. BMC Pregnancy Childbirth. 2019 Sep 6;19:329.

13. Das A, Sai Mala G, Singh RS, Majumdar A, Chatterjee R, Chaudhuri I, et al. Prelacteal feeding practice and maintenance of exclusive breast feeding in Bihar, India – identifying key demographic sections for childhood nutrition interventions: a cross-sectional study. Gates Open Res. 2019 Jun 14;3:1.

14. Raina, S. K., Mengi, V., & Singh, G. (2012). Determinants of Prelacteal Feeding Among Infants of RS Pura Block of Jammu and Kashmir, India. Journal of family medicine and primary care, 1(1), 27-29. <https://doi.org/10.4103/2249-4863.9444>

A COMPARATIVE CROSS-SECTIONAL STUDY ON THE PREVALENCE OF SELF-PERCEIVED USELESSNESS AND ITS DETERMINANTS AMONG ELDERLY IN RURAL AND URBAN FIELD PRACTICE AREA, CHENNAI

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Abstract

BACKGROUND : Self-perceived uselessness means an individual's own negative perception about his or her usefulness or importance to family, friends, and/or community. In developed Countries Self-perceived uselessness is associated with a higher risk of death, higher rates of functional impairment and disability, fewer rates of recovery from illness, and poorer cognition and mental health. It's unclear whether the findings hold true in developing countries like India, where research on the link between self-perceived usefulness and health is scarce.

AIMS : The aim of the present research was to determine the prevalence of self-perceived uselessness in community setting and its determinants among the study population.

SETTINGS AND DESIGN : This comparative cross-sectional study was conducted among eighty elderlies each in urban and rural field practice area (n=160) using simple random sampling.

METHODS AND MATERIAL : Data on self-perceived uselessness collected using pretested semi-structured interviewer administered questionnaire and functional status by Modified-Barthel-ADL Score. Results were analysed in SPSS version 16 using Chi square test

RESULTS : 31.5% of the respondents [Urban-35%, Rural-27.5%] had perceived themselves as useless and nearly 40.62 % had some form of dependency in day-to-day activities. Marital Status[p=0.00], Comorbidity duration[p=0.00], Residence[p=0.00] and Modified Barthel ADL Score[p=0.00] were all significantly associated.

CONCLUSIONS : More than 1/4th of the elderly population perceived themselves as useless when irrespective of their residence. To improve the quality of life in the elderly, functional status can be screened, and regular physiotherapy can be provided to individuals who require support with day-to-day activities. Similarly, Bereavement Support system needs to be developed to address self-perceived uselessness among Elderly widows.

KEYWORDS : "Elderly"; "Self-perceived"; "Uselessness"; "Dependency"; "Community"

INTRODUCTION

Self-perceived uselessness normally means an individual's own negative assessment or perception about his or her usefulness or importance to family, friends, community, and/or the larger society and his or her general understanding of the aging process.¹ Self-perceived uselessness is seen as a main element of self-perception of ageing or self-ageism that influences one's thoughts and emotions and affects one's behavioural habits in the elderly, which could adversely affect one's psychological and physiological well-being in turn. Plenty of evidence has consistently demonstrated that self-perceived uselessness is associated with higher risk of death², higher rates of functional impairment and disability², chronic conditions, lower rates of recovery from illness, poorer functions of cognition and mental health, and lower rates of self-rated good health and life satisfaction. In addition to it, many studies also reported that positive self-perceptions of aging (i.e., the absence of self-perceived uselessness) are linked with better overall survival, functional status, and life satisfaction³. Feelings of uselessness may also negatively

influence self-care and engagement in health promotion behaviours⁴. An estimated population of 113377 aged persons are living alone or with spouse only, as per NSSO 60th round report, India. Out of these, in 19% elderlies, their child/grandchild/sibling is residing within the same building and 37% elderlies are so in which their child/grandchild/sibling reside within the same village/town⁵. This declining social network size and decrease in social contacts results in health decline among older age, will reduce the performance of older adults and may cause self-perceived uselessness. In a Study done in North Bengaluru, nearly half (45%) of the elderly had agreed that they had perceived themselves as useless as they age, but main limitation is it was done in old age homes.⁶ Another limitation in the existing literature



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of self-perceived uselessness is that the research has focused primarily on Western cultures and high-income countries. It is uncertain if the results in developed countries are true in developing countries, such as India, where the survival of older adults is more selective because of high mortality at younger ages, and where research is very few on the correlations between self-perceived inefficiency and health or mortality. In view of the above, the objective of the present research was to determine and compare the prevalence of self-perceived uselessness and its determinants among elderly in rural and urban Chennai in community setting. This will provide us avenues for intervention opportunities resulting in better Quality of Life among surviving elderly.

SUBJECTS AND METHODS

This Community-based Comparative Cross-sectional was done in rural and urban field practice area of Madras medical college over a period of 2 months in which data was collected over a period of one week among elderly [Age above 60 years] who were residents in that area for a minimum period of one year. Those suffering from mental illness/unable to comprehend/severe cognitive decline and those who were Bed ridden/terminally ill and those not willing for the study were excluded. The sample size was calculated based on Rural/Urban assuming +/- 15% of previous prevalence of 20% in a community-based study in China [CLHLS]⁷ with a 95% confidence and 10% excess sampling to account for non-response, sample size of 160 was derived i.e., 80 in each group.

$$n = (Z\alpha/2 + Z\beta)^2 (p_1q_1 + p_2q_2), (p_1 - p_2)^2$$

$$n = (0.84 + 1.96)^2 (20 \times 80 + 5 \times 95) / (20 - 05)^2 = 72.3,$$

$$10\% \text{ excess} = 80 \text{ per group}$$

Based on data available from Family Health Register in Puliyanthope PHC [i.e., Urban] and Medavakkam PHC [i.e., Rural], the number of elderlies in the area were enumerated alphabetically and using random number generator tool, 80 elderlies were selected [Only one elderly/Family]. The data was collected throughout the daytime to include as many elderlies as possible. If any elderly did not meet the inclusion criteria they were skipped, and the next name was chosen. After getting informed written consent, Interviewer administered Semi structured questionnaire which consisted of socio-demographic details and general health condition; Self-Perceived Uselessness was assessed by Philadelphia Geriatric Centre Morale Scale⁸; and Activities of Daily Living by Modified Barthel Index for Activities of Daily Living⁹ was collected. The questionnaire took less than 20 minutes to complete and was prepared in Tamil and English

to accommodate a participant's preference. Philadelphia Geriatric Centre Morale Scale⁸ guideline scores of 13 to 17 would be considered high scores on the morale scale, 10 to 12 falls within the mid-range and scores under 9 are at the lower end. They provide assessment of individual's psychological disposition. Barthel⁹ scores are that scores of 0-20 indicate "total" dependency, 21-60 indicate "severe" dependency, 61-90 indicate "moderate" dependency, and 91-99 indicates "slight" dependency. We analysed the data using the Statistical Package for Social Sciences (SPSS) software, version 16. The results are presented as means and standard deviations for normally distributed data, or as percentages for categorical data. Categorical variables were compared using Chi-square test. For all the analysis, p value of ≤ 0.05 was assumed to be statistically significant. We took ethical approval from the Institutional Ethics Committee of the Madras Medical College. Participation in this study was completely voluntary, and no incentive was provided to the participants. The respondents were informed about the potential scopes and implications of the findings of this study and were requested to participate voluntarily. Figure 1 shows the flowchart of sampling methodology.

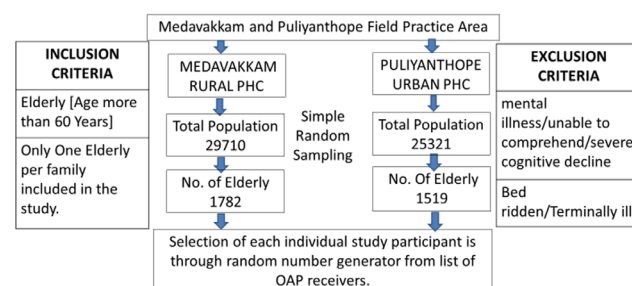


Figure 1: Knowledge scores of the participants about breastfeeding (n=110)

RESULTS

Most important thing is creating awareness in public to improve the quality control in healthcare Local health board should play main role in awareness programs. They must also know the role of municipalities and their approach towards such landfill sites (Swaroopanand, Mahavidyalya, and Bhilai 2015)

This study aims to assess the knowledge as well as attitude among general public living near an open landfill situated in a rural area of Tamil Nadu. Also, to assess the practice of these people regarding preventive measures against air pollution as well as regarding solid waste disposal. Thereby enabling them to take up an active role in the effective self-management of preventive measures against health hazards related to air pollution.

Table 1 : Distribution of socio-demographic variables across rural and urban (n=160).

Variables	Categories	Urban [80]		Rural [80]	
		n	%	n	%
Gender	Male	19	23.7	23	29
	Female	61	76.3	57	71
Education	Literate	57	71.3	52	65
	Illiterate	23	28.7	28	35
Marital status	Married	61	76.3	68	85
	Widow	19	23.7	12	15
Family type	Nuclear	68	85	47	59
	Joint family	12	15	33	41
Receiving old age pension	Yes	36	45	47	59
	No	44	55	33	41
Co-morbidities	Multiple	70	87.5	64	80
	Diabetes	34	48	27	42
	Hypertension	15	21	18	28
	Stroke	13	18	10	15
	Vision/hearing	6	8	3	5
	Cardiac	3	4	6	9
	Cancer	1	1	1	1
Recreational activities	Multi-media	34	42	30	38
	Outdoor [Park, Yoga]	6	8	10	12
	Peer gossip	26	33	33	41
	Others	14	17	7	9

Table 2 :Distribution of scores and stratification of Barthel's ADL and PGCS across Urban and Rural.

Variables		Percentage %		Stratification
Barthel ADL	Score	Urban	Rural	Dependency
Slight	91-99	58.9	59.85	No
Moderate	61-90	21.4	21.5	Yes
Severe	21-60	14.3	14.3	
Total	0-20	5.4	4.35	
PGCS*	Score	Urban	Rural	Self-perceived Uselessness
High morale	13-17	43	47	No
Mid	12-10	22	25.5	
Low morale	< 9	35	27.5	Yes

*Philadelphia Geriatric centre Morale Scale

Table 3 : Prevalence of Self-perceived uselessness

Prevalence of Self-perceived Uselessness	Overall n=160	Urban n=80	Rural n=80
n	50	28	22
% (95% C.I)	31.25% (24.17% - 39.04%)	35% (24.67% - 46.48%)	27.5% (18.10% - 38.62%)

Table 4 : Association between self-perceived uselessness and Dependency in Activities of Daily Living [Chi-square]

Dependency in Activities of Daily Living		Self-perceived Uselessness			
				OR [95% C.I.]	p-Value
		Yes	No		
	Overall	Yes	38	27	9.7 [4.5-21.3]
		No	12	83	
	Urban	Yes	22	10	15.4 [4.9-48]
		No	6	42	
	Rural	Yes	16	17	6.43 [2.2-19.2]
		No	6	41	

Table 5 : Association between study variables and Overall Self-perceived Uselessness

S.no	Variables		Self-perceived uselessness (n=160)			
			Yes	No	OR (95% C.I.)	p-Value
1	Age-group	> 75 years	22	46	NA	0.80
		< 75 years	28	64		
2	Gender	Male	11	31	NA	0.41
		Female	39	79		
3	Education	Illiterate	18	33	NA	0.45
		Literate	32	77		
4	Marital status	Widow	24	7	13.5 [5.3-35]	0.00*
		Married	26	103		
5	Type of family	Extended	18	27	NA	0.14
		Nuclear	32	83		
6	Co-morbidity	Nil	11	15	NA	0.18
		At least One	39	95		
7	Duration of co-morbidity	> 10 years	28	9	18.4 [7.2-47.2]	0.00*
		< 10 years	14	83		
8	Recreational activity	< 1 hour /day	25	45	NA	0.34
		≥ 1 hour /day	25	65		
9	Residence	Urban	45	35	5.5 [2.7-11.4]	0.00*
		Rural	15	65		

*Chi-square test p-value<0.05 taken as significant

Table 6 : Association between study variables and Self-perceived Uselessness for Urban study population

S.no	Variables		Urban Self-perceived Uselessness (n=80)				
			Yes	No	OR	95% CI	p-Value
1	Age group	> 75 Years	14	13	3.00	1.1	7.9
		≤75 Years	14	39			
2	Gender	Male	6	13	NA	NA	0.720
		Female	22	39			
3	Education	Illiterate	12	11	2.80	1.0	7.6
		Literate	16	41			
4	Marital Status	Widow	15	4	13.85	3.9	48.9
		Married	13	48			
5	Type of Family	Extended	5	7	NA	NA	0.744
		Nuclear	23	45			
6	Co-morbidity	Nil	4	8	NA	NA	1.000
		At least one	24	44			
7	Duration of Co-morbidity	> 10 years	15	3	22.78	5.4	95.6
		≤10 Years	9	41			
8	Recreational Activity	< 1 hour /day	18	17	3.71	1.4	9.7
		≥ 1 hour /day	10	35			

*Chi-square test p-value <0.05 taken as significant

#Fischer's exact test p-value <0.05 taken as significant

Table 4 shows the association between dependency as scored by Barthel's activities of daily living index and Self-perceived uselessness as measured by the Philadelphia Geriatric centre morale scale. It was found that they were significant for overall and for urban and rural areas separately. As shown in Table 5, Determinants found to be significantly associated [p<0.05] with Overall Self-perceived uselessness

were loss of spouse, and duration of co-morbidity more than 10 years and residence in urban area. Factors exclusively significant for urban area, in-addition to previously stated, were age above 75 years, illiteracy, and participation in recreational activities less than 1 hour/day. Factors significant only for rural areas were living in nuclear family and having any one co-morbidity. Individual factors found to be significant for Urban and Rural self-perceived uselessness are given separately in Table 6 and Table 7 respectively.

Table 7 : Association between study variables and Self-perceived Uselessness for Rural study population

S.no	Variables		Rural Self-perceived Uselessness (n=80)					
			Yes	No	OR	95% CI		p-Value
1	Age-group	> 75 years	8	33	NA	NA	NA	0.101
		≤ 75 years	14	25				
2	Gender	Male	5	18	NA	NA	NA	0.464
		Female	17	40				
3	Education	No	6	22	NA	NA	NA	0.372
		Yes	16	36				
4	Marital Status	Widow	9	3	12.69	3.0	53.6	0.001 [#]
		Married	13	55				
5	Type of family	Extended	13	20	2.74	1.0	7.5	0.046 [*]
		Nuclear	9	38				
6	Co-morbid	No	7	7	NA	NA	NA	0.051
		Yes	15	51				
7	Duration of co-morbidity	> 10 years	13	6	18.20	4.8	69.5	0.000 [#]
		≤ 10 years	5	42				
8	Recreational Activity	< 1 hour /day	7	28	NA	NA	NA	0.180
		≥ 1 hour /day	15	30				
*Chi-square test p-value <0.05 taken as significant								
[#] Fischer's exact test p-value <0.05 taken as significant								

DISCUSSION

In a previous study done in old age homes in North Bengaluru by Rangra et.al⁶, nearly half (45%) of the elderly had agreed that they had perceived themselves as useless as they age. In our study, the prevalence was found to be 31.25% [95%CI: 24.3 to 38.6] overall [Urban-35%/Rural-27.5%]. This difference may be due to Urban/Rural divide and that the previous study was done in a non-community setting.

In the same study by Rangra et.al⁶, significant association was seen between self-perceived uselessness and functional dependency, gender, education, and having some form of activities during their leisure time. In our study too those factors were found to be significant. In our study the prevalence of co-morbidities was 83.75% which agree with various studies in India where health problems, especially cardiovascular illnesses and diabetes are widely prevalent¹⁰. Previous history of Covid was only 8.1% hence unlikely to be bias our interview on self-perceived uselessness. In our study, nearly half of the elderlies were receiving old age pension, yet it was not found to be significant for self-perceived uselessness.

It was seen that older age groups (age >75 Years) experienced more self-perceived uselessness in urban locality. This agrees with Zhao et al.¹ study in which compared to younger ages 65–79, octogenarians (ages 80–89), nonagenarians (ages 90–99), and centenarians (ages 100+) experienced increased risk of high frequency of self-perceived uselessness relative to low frequency by 69%, 76%, and 76%, respectively. This conclusion is reasonable since as people age, their health deteriorates and their activities decrease, leaving them with fewer opportunity to participate in other activities.

In our study, married persons felt less useless than bereaved people. Zhao et al. discovered similar results¹. Married couples benefit from their spouse's emotional support. Confiding in family, friends, and relatives, as well as among themselves, is a significant component linked to a self-perceived uselessness. Zhao et al.¹ came at the same conclusion. People who had more than one chronic condition and were reliant on others for their ADL felt less useful than those who were functionally independent and had no chronic morbidity. This discovery was in line with the findings of Rangra et.al⁶ which was that Majority of those who perceived uselessness had one or >1 chronic morbidities and were functionally dependent (81.2%). And that there was significant association between self-perceived uselessness and functional dependency.

LIMITATIONS

Because this was a cross-sectional study, temporal association between factors could not be assessed, which could have shed light on the onset and potential factors influencing the onset of self-perceived uselessness. Where records of co-morbid conditions were not available, the participants' self-reporting of morbidities were not taken into consideration. Similarly, as this study was conducted on a house-to-house survey basis, number of males in the study group was less [25% only] this was because most of them were either employed in menial works or had gone for health/social visits.

CONCLUSION

From this study, we conclude that more than 1/4th of the elderly population perceived themselves as useless when irrespective of their residence. There was a significant association between self-perceived uselessness and variables such as gender, education, leisure activities, and functional status (ADL). In India, there are few studies on the social health of the senior age group. Self-perception of uselessness, which has been researched in a few other nations, has been

proven to have an impact on the health of the elderly. In India, more research on the self-perception of uselessness in the elderly age group is recommended.

RECOMMENDATIONS

Being functionally independent and having familial support may have an impact on Self-perceived uselessness. To improve the quality of life in the elderly, functional status can be screened, and regular physiotherapy can be provided to individuals who require support with day-to-day activities. Similarly, Bereavement Support system needs to be developed to address self-perceived uselessness among Elderly widows.

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REFERENCES

1. Zhao Y, Sautter JM, Qiu L, Gu D. Self-perceived uselessness and associated factors among older adults in China. BMC Geriatr [Internet]. 2017 Jan 9 [cited 2022 Nov 23];17(1):1–19. Available from: <https://bmccgeriatr.biomedcentral.com/articles/10.1186/s12877-016-0406-z>
2. Gruenewald TL, Karlamangla AS, Greendale GA, Singer BH, Seeman TE. Feelings of Usefulness to Others, Disability, and Mortality in Older Adults: the MacArthur Study of Successful Aging. J Gerontol B Psychol Sci Soc Sci [Internet]. 2007 [cited 2022 Nov 23];62(1). Available from: <https://pubmed.ncbi.nlm.nih.gov/17284554/>
3. Levy BR, Slade MD, Kunkel SR, Kasl S v. Longevity increased by positive self-perceptions of aging. J Pers Soc Psychol [Internet]. 2002 [cited 2022 Nov 23];83(2):261–70. Available from: <https://pubmed.ncbi.nlm.nih.gov/12150226/>
4. Zhao Y, Dupre ME, Qiu L, Gu D. Changes in perceived uselessness and risks for mortality: Evidence from a National sample of older adults in China. BMC Public Health [Internet]. 2017 Jun 9 [cited 2022 Nov 23];17(1):1–9. Available from: <https://bmcpubhealth.biomedcentral.com/articles/10.1186/s12889-017-4479-1>
5. Reports/Publications | MOSPI [Internet]. [cited 2022 Nov 23]. Available from: <https://www.mospi.gov.in/reports-publications>
6. Rangra G, Archana S, Imran M. A study on self-perceived uselessness and its determinants among residents of old age homes in North Bengaluru. Indian J Public Health [Internet]. 2019 Jul 1 [cited 2022 Nov 23];63(3):227. Available from: <https://www.ijph.in/article.asp?issn=0019-557X;year=2019;volume=63;issue=3;spage=227;epage=232;aulast=Rangra>
7. Chinese Longitudinal Healthy Longevity Survey (CLHLS), 1998-2014 [Internet]. [cited 2022 Nov 23]. Available from: <https://www.icpsr.umich.edu/web/NACDA/studies/36692>
8. Lawton MP. The Philadelphia Geriatric Center Morale Scale: a revision. J Gerontol [Internet]. 1975 [cited 2022 Nov 23];30(1):85–9. Available from: <https://pubmed.ncbi.nlm.nih.gov/1109399/>
9. Shah S, Vanclay F, Cooper B. Improving the sensitivity of the Barthel Index for stroke rehabilitation. J Clin Epidemiol [Internet]. 1989 [cited 2022 Nov 23];42(8):703–9. Available from: <https://pubmed.ncbi.nlm.nih.gov/2760661/>
10. Lena A, Ashok K, Padma M, Kamath V, Kamath A. Health and social problems of the elderly: a cross-sectional study in udupi taluk, karnataka. Indian J Community Med [Internet]. 2009 Apr 1 [cited 2022 Nov 23];34(2):131–4. Available from: <https://pubmed.ncbi.nlm.nih.gov/19966960/>

ORIGINAL ARTICLE - PUBLIC HEALTH

PREVALENCE OF CHRONIC OTITIS MEDIA AND ITS ASSOCIATED FACTORS AMONG RURAL SCHOOL CHILDREN OF TIRUNELVELI DISTRICT AFTER THE LOCKDOWNS BETWEEN 2020-2021 DUE TO COVID-19: A CROSS-SECTIONAL STUDY

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Abstract

INTRODUCTION : Chronic otitis media (COM) is a major health problem throughout the world especially in underdeveloped and developing countries including India. In India, the prevalence of COM varies from 1.4 to 15.3 in various previous studies. This study was conducted in post covid period, to estimate the prevalence, the significance of certain risk factors of chronic otitis media among school children, and also to evaluate their level of health seeking behavior in COM.

METHODS : A cross sectional study involving 3432 school children from schools around Model Rural Health Research Unit Tirunelveli, was undertaken after the schools reopened from the COVID-19 lockdown period between November, 2021 to March 2022. Detailed report of symptoms, habits, treatment history were recorded from parents/guardian. Complete otological examination was done by ENT Surgeon and findings were recorded. Risk factors included were age, sex, nutritional status, source of drinking water, passive smoking in home, overcrowding, parent literacy status, habit of ear picking, habit of taking bath in ponds, and recurrent nasal infections among the children.

RESULTS : The overall prevalence of chronic otitis media is 1.14%. The major symptoms among those with COM are ear pain (11.7%) and ear discharge (28%). Among the risk factors, habit of ear picking (p value= 0.04), recurrent nasal infections (p value < 0.000) were found to be significantly associated with COM. The students with h/o ear discharge were classified into new (8%), persistent (18%), recurrent (26%) and dry perforated (46%), because of which it was found out 50% of the children were not seeking definitive care for their problem.

CONCLUSION : This study which was conducted post lockdowns of 2020-2021 due to COVID-19 which was able to establish a lower prevalence rate of chronic otitis media when compared to other studies done in similar settings before this period. The percentage of children seeking appropriate treatment is 50%, so chronic otitis media still continues to exist as a public health problem. This highlights a need for better awareness on this issue among both teachers and parents in order to weed out the problem among school going children. Better screening practices and better referral mechanisms at primary level is necessary.

KEYWORDS : Otitis , COM, CSOM

INTRODUCTION

Otitis media is the inflammation of the middle ear, mastoid and eustachian tube. It is classified into acute otitis media, otitis media with effusion and chronic otitis media. Acute otitis media (AOM) is one of the most common diseases in children. By the end of 3 years 50 to 70 % of all children would have suffered at least one episode of acute otitis media.¹ The course of AOM is variable and in certain times it is also self-resolving.² practices of treatment for the AOM also varies depending on the availability of the health care services. Inadequate or improper treatment may lead it to a chronic disease or sometimes to a partly contained form

with retained effusion within the middle ear.^{3,4} Inflammation of the middle ear , mastoid cavity leading to a discharge for more than 2 weeks is called chronic otitis media. Because of recurrent and persistent discharge of middle ear cavity through a perforation of the tympanic membrane it is also referred as chronic suppurative otitis media.^{5,6,7} The factors



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related to development of chronic otitis media include inadequate antibiotic treatment, frequent upper respiratory tract infections, nasal disease⁸, and poor living conditions with poor access to medical care.^{3,4,5,6,7} WHO recognize a prevalence of > 1% in school children as an avoidable burden and if more than 4% it represents massive public health problem requiring urgent interventions. In a report by WHO in 2004, the prevalence of CSOM among Indian school children was 7.8% and India was listed among the group with highest prevalence.⁹ In the same classification American Indians and United Kingdom were listed in group with lowest prevalence (<1%). In a school-based study done in south India in 1995 states that the prevalence of all forms of otitis media was 17.6%.¹⁰. But in another study by¹¹.in 2010 showed the prevalence was 8.6% in India and 7.4% in Yemen¹² which is almost half of that value in the previous century. In an Uttar Pradesh based study in 2016 the prevalence of CSOM was 6.1%.¹³. There was a difference in prevalence among rural and urban school students, 1.41% and 5.46% correspondingly in another study done from Patiala in 2017.¹⁴ In Tamil Nadu the public health facilities have been largely improved in the past decade and there is a need to study about present scenario in otitis media.

AIM AND OBJECTIVES

Our objective was to estimate the prevalence of COM and to find the associated factors.

METHODOLOGY

We conducted a cross sectional descriptive study involving 3432 children aged 5 to 19 years, studying in 35 schools in Kallur, MRHRU (Model Rural Health Research Unit) field practice area, Tirunelveli, established by the Department of Health Research, Government of India which is linked to the Tirunelveli Medical College. It is mentored by the ICMR – National Institute of Epidemiology, Chennai.

MRHRU field practice area has a population of 36,663 and is an area that falls under Papakudi and Mannur blocks in Tirunelveli district; comprising of 14 village clusters. There are 28 Primary Schools, 2 Middle Schools, 2 High Schools and 3 Higher Secondary School. The total number of school going children in MRHRU field practice area were 3851. Among them 3432 students who were present on the day of the school camp, between the age group of 5 to 19 years, were screened by a team consisting of Otorhinolaryngologist and allied health workers including the Principal Investigator (PI) period between November, 2021 to March 2022. Permission was obtained from all the necessary authorities from District

to block level and from the institutional ethics committee Tirunelveli medical college before the start of the study. The Headmasters of each school fixed a date one week prior for the screening of students. For children studying up to 8th grade Informed written consent and assent was obtained from parents/guardians and students respectively. For the rest of the children only written consent was obtained from Parents/guardians and they were informed to be present on the day of screening.

CLINICAL AND AUDIOLOGICAL EXAMINATION

At the time of examination 125 students were found to have excessive wax, who were excluded, so 3267 students were considered for further evaluation. And each student is assigned with computer generated unique identification number. This number is fixed throughout the child's curriculum for future reference. Examination data are collected in 2 parts. Part I includes demographic profiles, Part II contain all clinical examination including otoscopic ear examination, precise nose, throat and neck examination details. Screening audiogram is done for those children with complaints of hard of hearing and those with otitis media.

RESULTS

A total of 3432 children were screened between the ages of 5 and 19 years. Out of them 1659 (48.3%) were boys and 1773 (51.7%) girls. 1893 (55.1%), 1463 (42.6%) and 76 (2.2%) children were in the age groups of 5 to 9 years, 10 to 14 years, 15 to 19 years respectively. 54%, 28%, 17% and 1% of the students were studying in primary, middle, secondary and higher secondary schools respectively. (Table 1)

CHRONIC OTITIS MEDIA

Out of the children examined only 38 (1.14%) were found to have COM (Figure 1). Squamous and mucosal types of the disease were found in 10.52% and 89.47% of the students respectively.

The predominant ear related history among all the students was ear pain 89 (2.50%). Out of which those with ear pain for more than 1 week are 6 (6.74%). 28 (31.46%) students reported to have recurrent ear pain in the past 1 year. 26 (0.75%) students had complained of having ear discharge, out of whom 14 (50%) had recurrent discharge, 11 (42.30%) of them with history of ear discharge had CSOM. (Table 2)

Both male and female children have been affected by CSOM in equal number (19). School children of ages 5-9 (1.11%) and 10-14 (1.16%) were equally affected by CSOM.

But none of those in ages of 15-19 were found to have the disease, this could also be because of the very low proportion of students in that age group constituted our study population (2.21%). Strong association with COM was found among students with children having history of ear picking ($P=0.041$), history of more than 5 episodes of throat pain in the past 1 year ($P=0.038$), history of more than 5 episodes of nasal block in the past 1 year ($P=0.010$). Among the symptoms ear pain (11.71%) and ear discharge (28.94%) was the most frequent among those with COM and had a strong association with values of $P=0.010$, $P<0.00$ respectively, predominant number of those who had COM were examined to have mild to moderate hearing loss (92.10%). (Table 2)

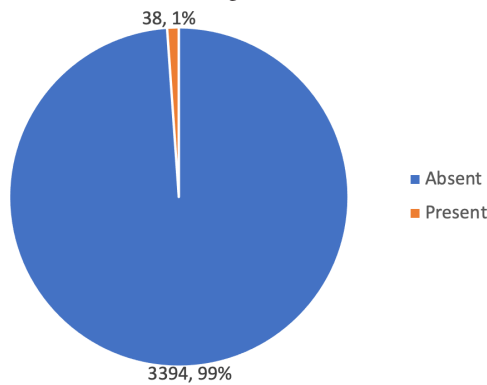


Figure 1: COM Prevalence

Table 1: Socio- Demographic Profile of the Students

Characteristics		Count	Percentage
Education Category	Primary	1840	54%
	Secondary	963	28%
	High School	584	17%
	Higher Sec School	45	1%
Sex	Male	1659	48.30%
	Female	1773	51.70%
Age Category	5-9	1893	55%
	10-14	1463	43%
	15-19	76	2%
Family Type	Nuclear Family	2589	75.4%
	Joint Family	649	18.9%
	Single Parent	160	4.7%
	Guardian Custody	26	0.8%
	Others	8	0.2%
Father Occupation	Unemployed	326	9.5%
	Laborer	582	17.0%
	Self-employed	1124	32.8%
	Farmer	850	24.8%
	Clerical	182	5.3%
	Shop Keeper	167	4.9%
	Semi professional	16	0.5%
Mother Occupation	Professional	11	0.3%
	Unemployed	267	7.8%
	Laborer	615	17.9%
	Self-employed	1131	33.0%
	Farmer	879	25.6%
	Clerical	316	9.2%
	Shop Keeper	145	4.2%
	Semi professional	18	0.5%
	Professional	6	0.2%

Table 2 : COM Association with risk factors

S. No	Characteristics	Com		Chi-Square
		Absent	Present	
1.	Sex	Male 1640(98.85 %)	19(1.15 %)	0.837
	Female	1754(98.93 %)	19(1.07 %)	
2.	Age	5 - 9 1872(98.89 %)	21(1.11 %)	1.000*
	10 - 14	1446(98.84 %)	17(1.16 %)	
	15 - 19	76(100 %)	0(0 %)	
3.	Class	Primary 1821(98.97 %)	19(1.03 %)	0.068*
	Secondary	946(98.23 %)	17(1.77 %)	
	High School	582(99.66 %)	20(3.34 %)	
	Higher Sec. School	45(100 %)	0(0 %)	
4.	Family Type	Nuclear Family 2557(98.76 %)	32(1.24 %)	0.175*
	Joint Family	646(99.54 %)	3(0.46 %)	
	Single Parent	158(98.75 %)	2(1.25 %)	
	Guardian Custody	25(96.15 %)	1(3.85 %)	
	Others	8(100 %)	0(0 %)	
5.	Does your child have habit of ear picking?	Yes 67(95.71 %)	3(4.29 %)	0.041*
	No	3327(98.96 %)	35(1.04 %)	
6.	Does your child have the habit of taking bath in public ponds/rivers?	Yes 331(98.51 %)	5(1.49 %)	0.414*
	No	306(98.93 %)	33(1.07 %)	
7.	Residential status	Hostel 27(100 %)	0(0 %)	1.000*
	Home	3363(98.88 %)	38(1.12 %)	
	Others	4(100 %)	0(0 %)	
	Public transport	494(98.95 %)	5(0.7 %)	
	Bicycle	119(98.35 %)	2(1.65 %)	
	Walk	2021(98.78 %)	25(1.22 %)	
8.	Mode of transport to school	Parent/care take drop 208(99.52 %)	1(0.48 %)	0.905*
	Private transport (auto/ car/ van)	493(99 %)	5(1 %)	
	Others	82(100 %)	0(0 %)	
9.	Source of Drinking water at household	Protected 3837(98.88 %)	32(1.12 %)	1.000
	Unprotected	526(98.87 %)	6(1.13 %)	
10.	LPG	Yes 3240(98.87 %)	37(1.13 %)	1.000*
	No	123(99.19 %)	1(0.81 %)	
11.	Firewood	Yes 616(98.25 %)	11(1.75 %)	0.093
	No	2747(99.03 %)	27(0.97 %)	
12.	Kerosene	Yes 40(97.56 %)	1(2.44 %)	0.371*
	No	3323(98.9 %)	37(1.1 %)	
13.	Electric stove	Yes 20(100 %)	0(0 %)	1.000*
	No	3343(98.88 %)	38(1.12 %)	
14.	Is there provision for Exhaust facility for kitchen smoke in your kitchen?	Yes 2273(99 %)	23(1 %)	0.355
	No	1090(98.64 %)	15(1.36 %)	
	2	14(100 %)	0(0 %)	
	3	219(98.21 %)	4(1.79 %)	
	4	156(98.8 %)	19(1.2 %)	
	5	994(99.3 %)	7(0.7 %)	
	6	384(98.21 %)	7(1.79 %)	
	7	222(99.55 %)	10(0.45 %)	
15.	No. of members in the family	Yes 51(100 %)	0(0 %)	1.000*
	No	3343(98.88 %)	38(1.12 %)	
16.	Does anybody in your family have the habit of smoking inside home?	Yes 27(100 %)	0(0 %)	1.000*
	No	3367(98.88 %)	38(1.12 %)	
17.	Did your child have more than five episodes of fever in the past 1 year?	Yes 26(92.86 %)	2(7.14 %)	0.038*
	No	3368(98.94 %)	36(1.06 %)	
18.	Did your child have more than five episodes of throat pain in the past 1 year?	Yes 46(95.83 %)	2(4.17 %)	0.098*
	No	3348(98.94 %)	36(1.06 %)	
19.	Did your child have more than five episodes of nasal discharge in the past 1 year?	Yes 38(92.68 %)	3(7.32 %)	0.010*
	No	3356(98.97 %)	35(1.03 %)	
20.	Did your child have more than five episodes of nasal block in the past 1 year?	Yes 3312(98.98 %)	34(1.02 %)	0.014*
	No	82(95.35 %)	4(4.65 %)	
21.	Does your child have ear pain?	Yes 15(57.69 %)	11(42.31 %)	0.000*
	No	3379(99.21 %)	27(0.79 %)	
22.	Does your child have ear discharge?	Yes 13(100 %)	0(0 %)	1.000*
	No	3381(98.89 %)	38(1.11 %)	

*Fisher's Exact Test

Only 4 people fit the criteria for a newly discharging untreated ear. While 9 students had a persistently discharging initially treated ear, 14 students had a recurrently discharging ear and 15 had a dry perforated ear drum with hearing. The predominant number of those with COM fell in 3 rd category (36.84%) or 5 th category (39%). (Table 3)

Table 3: Classification of children based on their presentation with ear discharge as given by WHO's Global burden of otitis media, 2004

Classification	Number of students
A newly discharging untreated ear	4
A persistently discharging, initially treated ear	9
A recurrently discharging ear	14
A discharging ear with headache, fever dizziness and other danger signs	0
A dry perforated ear drum with hearing loss	15

Other findings

The prevalence of Acute Suppurative Otitis Media (ASOM), Otitis Media Externa (OME) were 2.97% and 3.67% respectively.

Table 4: Prevalence of other related ear findings

Disease	Prevalence
ASOM	2.97%
OME	3.67%
ME	0.14%

DISCUSSION

This study done among school children in MRHRU field practice area in southern most district of Tirunelveli, it is the first of its kind in this part of India. And it had been conducted in the post the period post lockdown due to COVID-19, as soon as the schools reopened. All necessary precautions were taken as per the government guidelines that prevailed at that time. The prevalence of chronic otitis media was 1.14% which was much lower than the previous studies which reported prevalence rates of 8.6% and 6% among preschool children and school children respectively, while a recent study done in Karnataka in 2019 among rural students has estimated the prevalence to be 5.2%^{15, 16, 17}. Availability and accessibility of good primary healthcare in that area and improvement in public hygiene over years should be considered as a reason for reduced prevalence. The long periods of online classes, lockdowns, ban on major festivals and other gatherings during the COVID-19 pandemic are the other factors to be considered. The children were mostly homebound, and the possibility of cross infection was drastically low. The media advertisement of wearing masks, hand hygiene and social distancing could be other factors that reduced spread of respiratory tract infections and thereby leading to control and reduced prevalence of chronic otitis media.

In this study a strong association was found to be present between CSOM and symptoms related to history of recurrent respiratory tract infections like recurrent nasal block and throat pain and h/o cleaning of ear with various objects. This is in accordance with the result described by Kumari et al and Muftah et al who also identified recurrent respiratory tract infections of more than three times per year to be an independent risk factor of CSOM. The association of Bathing in ponds with COM, which was considered to be a significant factor in some studies, was not found to be statistically significant in this study. And consumption of unprotected drinking water was also found to be not significant. This could also be a testament to better hygiene practice and good wash programs in the area^{18, 19}.

Active ear discharge is seen in 29 % of children and history of hard of hearing in 38.23% of children among those with COM. This indicates screening protocols based on symptoms alone, as used in school health programs may

not be sufficient for early identification. The most concerning issue was that majority of those who had COM (75.83%) fell in the category of 3 or above in the WHO classification for ear discharge. Those children who fell into categories of 2 or above might need access to tertiary care facilities with an ENT specialist for ideal treatment. But such patients are still in the primary care level and are not seeking for tertiary care, this could also be due to the COVID-19 pandemic situation. Hence appropriate referral mechanism should also be created.

CONCLUSION

The present study which is done in the post COVID-19 period is able to demonstrate a low prevalence of Chronic otitis media. Though it is low, C.O.M. continues to exist as a public health problem. This is because certain risk factors that were highlighted like recurrent respiratory infection, ear picking habits are still prevalent. Thus highlighting a need for better awareness on the issue among both teachers and parents in order to weed out the problem. By avoiding aforementioned risk factors, increasing public awareness of otological treatment for recurrent ear discharge, insisting on otoscopic examination in every school health camp, establishing pediatric otorhinolaryngology units in tertiary health care centres we shall attain higher standards in the treatment of Chronic Otitis Media.

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REFERENCES

1. Pediatr Clin North Am. 2009 Dec; 56(6): 1383–1399. Published online 2009 Dec 2. Doi: 10.1016/j.pcl.2009.09.007
2. Morris P. Chronic suppurative otitis media. BMJ Clin Evid. 2012 Aug 6;2012:0507. PMID: 23870746; PMCID: PMC3412293.
3. Jahn AF. Chronic otitis media: diagnosis and treatment. Med Clin North Am. 1991 Nov;75(6):1277-91. doi: 10.1016/s0025-7125(16)30388-1.
4. Kenna M. Epidemiology and natural history of chronic

- suppurative otitis media. Arch Otolaryngol Head Neck Surg., 1988, 97 (2) (Suppl. 137): 8
5. Kenna M. Etiology and pathogenesis of chronic suppurative otitis media. Arch Otolaryngol Head Neck Surg., 1988, 97 (2) (Suppl. 137): 16-17.
6. Emmett SD, Kokesh J, Kaylie D. Chronic Ear Disease. Med Clin North Am. 2018 Nov;102(6):1063-1079. doi: 10.1016/j.mcna.2018.06.008.
7. Tos M, Hvid G, Stangerup S-E, Andreassen UK. Prevalence and progression of sequelae following secretory otitis. Ann Otol Rhinol Laryngol 1990 (in press).
8. Gibson PG, Stuart JE, Wlodarczyk J, Olson LG, Hensley MJ. Nasal inflammation and chronic ear disease in Australian Aboriginal children. J Paediatr Child Health. 1996 Apr;32(2):143-7. doi: 10.1111/j.1440-1754.1996.tb00911.x. PMID: 8860389.
9. WHO. Chronic suppurative otitis media. Burden of illness and management options. 2004. http://www.who.int/child-adolescent-health/New_Publications/CHILD_HEALTH/ISBN_92_4_159158_7.pdf (last accessed 8 November 2005).
10. Verma AK, Vohra A, Maitra A, Banerjee M, Singh R, Mittal SK, Bharadwaj V, Batra V, Bhatia A, Aggarwal P, et al. Epidemiology of chronic suppurative otitis media and deafness in a rural area and developing an intervention strategy. Indian J Pediatr. 1995 Nov-Dec;62(6):725-9. doi: 10.1007/BF02825128. PMID: 10829951.
11. A. Sophia, Rita Isaac, Grace Rebekah, K. Brahmadathan, V. Rupa, Risk factors for otitis media among preschool, rural Indian children, International Journal of Pediatric Otorhinolaryngology, Volume 74, Issue 6, 2010, Pages 677-683, ISSN 0165-5876, <https://doi.org/10.1016/j.ijporl.2010.03.023>.
12. Muftah, S. et al. (2015) "Prevalence of chronic suppurative otitis media (CSOM) and associated hearing impairment among school-aged children in Yemen," Oman Medical Journal, 30(5), pp. 358–365. Available at: <https://doi.org/10.5001/omj.2015.72>.
13. Parvez, A. et al. (2016) "A cross sectional study of chronic suppurative otitis media and its associated factors among primary school children in rural and urban areas of Aligarh, India," International Journal of Community Medicine and Public Health, pp. 2150–2154. Available at: <https://doi.org/10.18203/2394-6040.ijcmph20162561>.
14. Kaur, I., J P, G. and Singh, D. (2017) "Prevalence of chronic suppurative otitis media in school going children of Patiala District of Punjab, India," Journal of Evolution of Medical and Dental Sciences, 6(75), pp. 5402–5407. Available at: <https://doi.org/10.14260/jemds/2017/1171>.
15. Sophia A, Isaac R, Rebekah G, Brahmadathan K, Rupa V. Risk factors for otitis media among preschool, rural Indian children. Int J Pediatr Otorhinolaryngol. 2010 Jun;74(6):677-83. doi: 10.1016/j.ijporl.2010.03.023.
16. V Rupa, A Jacob, A Joseph, Chronic suppurative otitis media: prevalence and practices among rural South Indian children, International Journal of Pediatric Otorhinolaryngology, Volume 48, Issue 3, 1999, Pages 217-221, ISSN 0165-5876, [https://doi.org/10.1016/S0165-5876\(99\)00034-8](https://doi.org/10.1016/S0165-5876(99)00034-8).
17. Bellad SA, Kavi A, Mudhol RS. Prevalence of Chronic Suppurative Otitis Media Among School Children Residing in Rural Area of Belagavi, South India. Indian J Otolaryngol Head Neck Surg. 2019 Nov;71(Suppl 2):1549-1552. doi: 10.1007/s12070-019-01627-9.
18. Kumari MS, Madhavi J, Krishna NB, Meghanadh KR, Jyothy A. Prevalence and associated risk factors of otitis media and its subtypes in South Indian population. Egypt J Ear Nose Throat Allied Sci. 2016;17:57–62. doi: 10.1016/j.ejenta.2016.04.001.
19. Muftah S, Mackenzie I, Faragher B, Brabin B. Prevalence of chronic suppurative otitis media (CSOM) and associated hearing impairment among school-aged children in Yemen. Oman Med J. 2015;30(5):358. doi: 10.5001/omj.2015.72.

ORIGINAL ARTICLE - PUBLIC HEALTH

A STUDY ON THE PREVALENCE OF DENGUE IN HOSUR MUNICIPAL CORPORATION AND STRATIFICATION OF THE AREA

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Abstract

ABSTRACT : In recent years it has been observed that Dengue emerges as a Public Health problem in Tamil Nadu, after a massive outbreak of Dengue cases during 2012. Subsequently the rise in dengue cases was noticed during 2017 and the incidence continues year after year in the State, with varying degree of intensity. So the Department of Public Health & Preventive Medicine has taken up the matter seriously and initiated scientific analysis of the data and field studies were under taken by involving the Institute of Vector Control and Zoonoses, Hosur. So under the guidance of the Director of Public Health & Preventive Medicine and Joint Director of Institute of Vector Control and Zoonoses, a study on the prevalence of dengue in Hosur Municipal Corporation area was taken up, since Hosur area in Krishnagiri district is reporting dengue cases year after year with considerable proportion to the district. Utilizing the data available, field visits were made during 2020 and 2021, the epidemiological and entomological parameter, were collected, analysed and it was felt that there is an urgent need to carry out control activities on stratification of areas to minimize the displacement of health state. The outcome of this exercise has helped to draw a stratification map of dengue for Hosur Municipal Corporation area. The existing surveillances for Dengue case detection, treatment and follow up measures are discussed in this paper. Further the required containment measures based on the stratification of the area is also proposed.

KEYWORDS : dengue; prevalence; entomological parameters- Stratification.

INTRODUCTION

Dengue is a mosquito borne disease which registers nearly 50 million cases annually. This disease is spread by Aedes species. Dengue affects entire globe, nearly 4 billion people are at risk by DEN V infections and most affected regions are from the developing countries. It causes threat to the tropical regions where the temperature is abnormal.¹ Rapid urbanization, global warming, environmental factors, human activities are the factors for its spread.

The contribution of India to total dengue cases in SEAR has increased from 6% in 2009 to 39% in 2017. Based on the transmission potential for Dengue, WHO has categorized the countries in SEAR into three categories ie A,B and C. Till 2009, India was under category B in which cyclical epidemics are more frequent, circulation of multiple virus serotypes and geographical expansion is occurring. Repeated out breaks of dengue have also been reported from many parts of the country.²

Many investigations over the dengue out breaks/ epidemics has been carried out, analysed and reported now and then in scientific journals. Tamil Nadu has reported outbreaks of dengue almost in all years from 2012. The number of

dengue cases reported from Tamil Nadu, Krishnagiri district and the study area ie Hosur Municipal Corporation area (HMC) is shown in Table.1&Fig.1

Table 1: Number of dengue cases reported from 2015-2019

Year	Tamil Nadu	Krishnagiri District	Hosur Corporation	Proportion of Hosur (%) to District.
2015	4535	148	81	54.73
2016	2531	60	31	50.82
2017	23294	337	107	31.75
2018	4486	91	48	52.75
2019	8527	185	45	24.32

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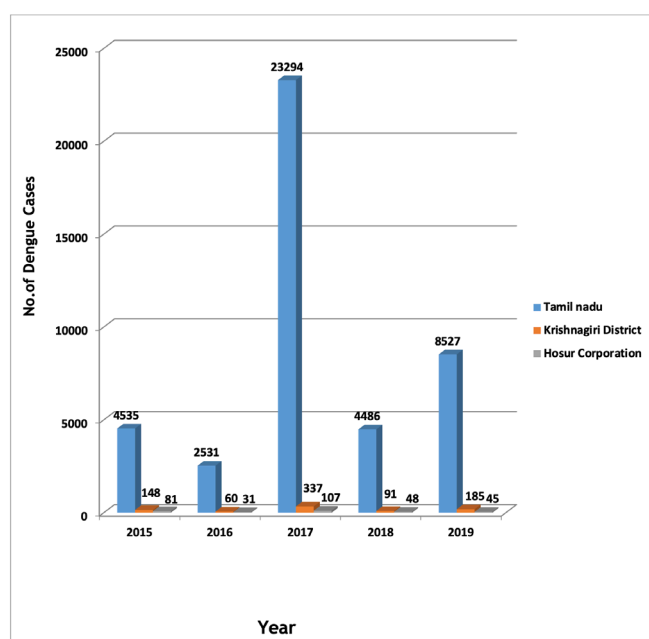


Figure 1: Dengue cases reported from State, District and Hosur Municipal Corporation

REASONS FOR SELECTION OF THE STUDY AREA

Out of the 4 known urban / semi urban area that are in Krishnagiri District, Hosur Municipal Corporation has been taken for Dengue prevalence study and for stratification for the following reasons.

- Hosur is a developing industrial urban area.
- The growth of urbanization is very marked with rise in number of residential areas and industries.
- Located on the NH connectivity Chennai and Bangalore, the two capital cities of states Tamil Nadu and Karnataka and thereby the population movement is all through the year.
- The proximity of Hosur to Bangalore urban area which reports seasonal dengue outbreaks.
- The area is vulnerable due to migratory population to this area from other

Urban cities.

- All most all wards have breeding sources for Aedes mosquitoes both during pre monsoon and post monsoon period, The climate in Hosur area is very conducive for the proliferation of the mosquitoes and longevity.
- The Hosur area has contributed 24.32 to 54.73% of the total cases of the district, Krishnagiri during the past 5 years.

STUDY AREA

Nickname(S): Little England, Rose city, flower City, Industrial City, Gateway of Tamilnadu, Chill City. Hosur is an industrial city located in the Indian country, State

of Tamil Nadu. It is located on the bank of the river River Ponnaiyar, 40 kilometres (25 mi) southeast of Bengaluru and 306 kilometres (190 mi) west of Chennai, the state capital of Tamil Nadu. Hosur is home to major manufacturing industries including Ashok Leyland, Titan, TVS Motors, Caterpillar, Sundaram Fasteners, Schaffler, and many others.

The Chandrachoodeshwara Swamy Temple, an 11th century temple, has inscriptions that tell about the contributions made by Rajendra Chola. Hoysalas ruled Hosur around 1200 A.D after the decline of Chola Empire and contributed to the temple. Then it came under Vijayanagara Samrajyam. Later, Hosur was part of Mysore Province until 1799, When Tipu Sultan lost the third Anglo-Mysore war, he handed over the southern part of the Mysore kingdom as a partial settlement to the English Government.

Hosur was constituted as a Selection Grade Town Panchayat in 1962 and then it was upgraded as Second Grade Municipality in the year 1992. In the year 1998, it was again upgraded to the Selection Grade Municipality. In 2011, the town panchayats Mathigiri, Village Panchayats Zuzuvadi, Mookandapalli, Avalapalli and Chennathur were included in Hosur Municipality. On 2019, Hosur was upgraded as the 13th Corporation city of Tamil Nadu comprising the adjoining areas.

Hosur experiences a tropical savanna climate (Koppen climate classification) with distinct wet and dry seasons. Due to its high elevation, Hosur usually enjoys salubrious and moderate climate throughout the year, with occasional heat. The coolest months are November to February with an average low temperature of 17°C winter temperatures. Winter temperatures rarely drop below 12°C with the lowest ever recorded temperature of 7.1°C recorded on 1st February 2018 and summer temperatures rarely exceed 35°C. Hosur receives rainfall from both the northeast and southwest monsoons, the wettest months are August, September and October. The summer heat is moderated by fairly frequent summer rains. The annual average humidity is 31% and average rainfall is 34 cm (Govt. web site)

MATERIALS AND METHODS

A frame work of this project work was prepared. The Dengue data available with the District Authorities, ie Deputy Director of Health Services, Krishnagiri of the state government were collected. Also the data pertaining to Hosur Municipal Corporation (HMC) were collected from Municipal Authorities. The area map of the Municipal Corporation showing the wards was also collected. The dengue data pertaining to Hosur Municipal Corporation was

analysed, ward wise for the last 5 years ie from 2015 to 2019.

By adopting random sampling method, 10 wards were selected for survey to obtain the entomological parameters through home visit and checking of breeding sources. This was done in two seasons ie pre monsoon and post monsoon period. The data related to rainfall, temperature, relative humidity were collected from the websites concerned for the period from 2015 to 2019. The Hosur Municipal Corporation area has 45 wards. The number of dengue cases reported, ward wise for the years 2015-2019 is shown in Table.3. Out of these 45 wards 10 wards were selected randomly. So to have a proportion of the area. All these 10 wards were visited, one in 10 houses (Systematic random basis) to find out the prevalence of breeding sources of Aedes mosquitoes and to understand socio economic conditions of the residents. Two rounds of visits were made covering pre monsoon period, ie February to May and post monsoon period, ie from September to November during 2020 and 2021 respectively. The receptivity and vulnerability of the area, ward wise was analysed using the available epidemiological and entomological data. The following variables were considered for grouping. The weightage obtained was taken for stratifying the area as low, medium and high. A map of the Hosur Municipal Corporation area was prepared based on this.(Fig.3)

RESULTS

The month wise dengue cases reported in Hosur Municipal Corporation area for the period from 2015 to 2019 is shown in the Table.2

Table 2: Year wise and month wise dengue cases reported from Hosur Municipal Corporation.

SL.No	Month	2015	2016	2017	2018	2019	Total
1	January	4	5	2	3	1	15
2	February	6	3	2	0	2	13
3	March	5	0	0	4	0	9
4	April	1	1	3	2	1	8
5	May	5	0	1	0	2	8
6	June	11	0	6	2	2	21
7	July	17	2	30	1	3	53
8	August	15	5	25	3	6	54
9	September	10	5	17	4	6	42
10	October	3	8	8	14	8	41
11	November	2	1	10	12	12	37
12	December	2	1	3	3	2	11
	Total	81	31	107	48	45	312

Table 3: Hosur Municipal Corporation. The number of dengue cases reported- ward wise for the period 2015 to 2019

Ward No.	2015	2016	2017	2018	2019	Total
1	7	0	8	6	5	26
2	1	1	3	1	4	10
3	6	1	14	4	2	27
4	6	2	8	4	3	23
5	5	3	6	3	2	19
6	3	1	2	1	2	9
7	1	1	1	0	0	3
8	0	1	1	0	0	2
9	1	1	4	0	0	6
10	4	4	2	0	0	10
11	2	0	5	2	0	9
12	1	1	3	0	2	7
13	2	0	4	2	0	8
14	2	1	5	0	5	13
15	10	3	6	3	3	25
16	6	1	5	3	1	16
17	1	0	0	0	0	1
18	1	0	1	0	0	2
19	1	1	3	0	0	5
20	0	0	0	2	3	5
21	0	1	2	0	0	3
22	0	0	0	1	0	1
23	0	0	1	0	0	1
24	1	2	3	0	1	7
25	0	1	3	0	1	5
26	0	0	2	2	2	6
27	0	0	0	1	0	1
28	3	0	0	0	0	3
29	0	0	0	0	0	0
30	1	1	1	0	0	3
31	2	1	0	3	1	7
32	1	0	1	3	3	8
33	1	0	2	0	1	4
34	1	0	1	1	0	3
35	2	0	4	2	1	9
36	0	0	1	0	0	1
37	2	1	0	0	0	3
38	3	2	0	1	0	6
39	0	0	2	1	2	5
40	0	0	1	0	0	1
41	4	0	0	2	0	6
42	0	0	1	0	0	1
43	0	0	0	0	0	0
44	0	0	0	0	0	0
45	0	0	1	0	1	2
Total	81	31	107	48	45	312

Based an earlier selection ward no.5,12,14, 24, 25, 28, 34, 38, 39 & 44 surveyed. The number of dengue cases reported from Krishnagiri during the year 2015-2019 is not very significant when compared to the state's cases. It ranges from 1.45% to 3.26% whereas; when comparing the number of cases reported from Hosur against the Krishnagiri district it is very significant. It ranges from 24.32% to 54.73% except Table1. The analysis of the dengue cases reported during

the year 2015,2016,2017,2018 &2019 shows a clear seasonal pattern Fig2. The influence of the south west monsoon which usually sets in 1st week of June in Tamil Nadu, in this part provides a good number of breeding sources for Aedes mosquito species, which in turn increases the density of the vector Ae.aegypti. The lean period in dengue cases ie from December through January, February, March and April is visible. The dengue case starts picking up from the last week of May and continues till October with a peak in July and in few years in October which is helps the transmission of Dengue in this part. The onset of Northeast monsoon in October helps to prolong the transmission season up to November.

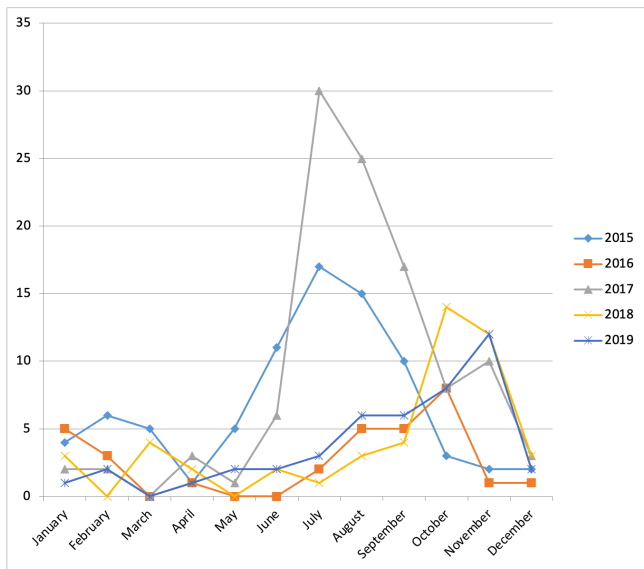


Figure 2: Trend of dengue cases in Hosur Municipal Corporation area during 2015-2019

To know abundance of the vector of dengue ie Ae.aegypti, the main vector in Tamil Nadu a survey of breeding sources and along with the check for breeding of Aedes spp. was carried out in two seasons of the year ie February to May and September to December in 2020-21, pre and post monsoon period respectively.

The entomological parameter observed during the survey was as follow.

Season	Entomological parameters			
	HI	CI	BI	PI
Pre monsoon -	7.56 -	0.83 -	8.83	14.78
Post monsoon -	6.10 -	0.89 -	8.57	36.19

DISCUSSION

The Hosur Municipal Corporation (HMC) area has been divided into 45 wards and 10 Divisions to carry out PH/ Sanitation activities etc. The number of dengue cases (Ward

Wise) reported during 2015 to 2019 is shown in Table 3. The analysis of this data clearly shows that all wards are not dengue prone. The wards 1,3,4&15 and adjoining wards 2,5,10,14&16 (Totally 9) have reported cases year after year. In such condition it seems that only 20% of the corporation area 'dengue prone' at the outset. But considering the various epidemiological, entomological and environment aspects, it is safely understood that 23 wards or 51% ie a little over half of the Corporation area is 'vulnerable' as the risk of transmission of dengue in high and medium degree. Hence all control measures to prevent dengue out break needs to be carried out in these identified areas.

Table 4: The activities recommended for the wards of Hosur Municipal Corporation for Dengue control based on the stratification of the area

Sl.No.	Activities	Low risk (22 wards)	Moderate risk (16 wards)	High risk (7 wards)
1	Strengthening of surveillance	+	++	+++
2	Case management	-	-	++ (For reported cases)
3	Vector management	++	+++	++++
4	Capacity building	++	+++	++++
5	IEC	++	+++	++++
6	Inter sectoral co ordination	+	++	+++
7	Monitoring and supervisions	++	+++	++++

+ = Routine

++ = Selective

+++ = Intensified

++++ = As required for Out Break Response (OBR)

OBR : All the recommended activities need to be carried into with concurrent monitoring, supervision and evaluation.

Low Risk Area- Ward No. 7, 8, 17, 18, 21, 22, 23, 27, 28, 29, 31, 32, 33, 34, 35, 36, 37, 40, 42, 43, 44, 45, (22)

Moderate Risk Area- Ward No. 2, 6, 9, 10, 11, 12, 13, 19, 20, 24, 25, 26, 30, 38, 39, 41 (16)

High Risk Area- Ward No. 1, 3, 4, 5, 14, 15, 16 (7)

Areas shown in the map (Fig.3)

In our country the peak incidence of dengue rather upsurge has been reported during July-November (NVBDGP, GOI,2020) As such this disease has a seasonal pattern, ie, the peak after the south west monsoon. Similar pattern is observed in Hosur area also, since more of rains a regular feature during south west monsoon.It has been observed that there is little variation in infection among male and female. Table.4 shows that both the male and female affected with dengue during the period varied from 33% to 54% in the case of male and 40% to 67% in the case of female. However the overall ratio is almost equal, when grouped for the period

from 2015 – 2019. The age group wise analysis shows that the earning age group ie >16 to 45 years is mostly affected by dengue. This shows that these groups of people are more exposed to mosquito (vector) bite than the other age group. The people >60 years and <5 years are not much affected and practically well protected / and may be not exposed to the bite of the vector mosquitoes.

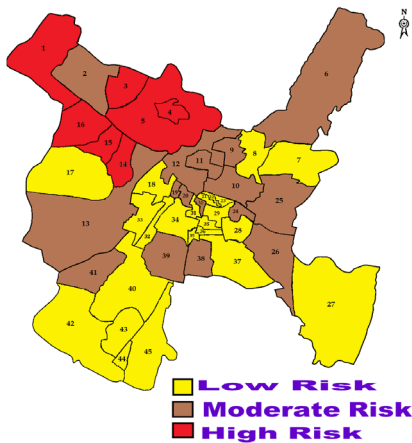


Fig.3. Hosur Municipal Corporation map showing the Stratum of Dengue.

Table 5: Sex -wise Dengue Incidence from 2015-2019

Year	Male	%	Female	%	Total
2015	44	54	37	46	81
2016	13	42	18	58	31
2017	56	52	51	48	107
2018	22	46	26	54	48
2019	22	49	23	51	45

The ward wise analysis of the data shows (Table. 3) that almost all wards have been affected (except 3 wards ie 29, 43 & 44). The receptivity and vulnerability which are the key elements in the transmission of the disease is very prominent in 23 wards which are identified as epidemic prone area and these wards are classified as high and medium risk areas. From the available entomological parameters- obtained through the field survey these entomological parameters are valuable to identify the area. It is under stood that the area maintains the mosquito genic condition with little variation except in the case of pupal index in both seasons. The habitat wise details are shown in Table.5. This parameter

also indicates the more possibility of transmission of dengue during post monsoon period. The same is inferred with the number of dengue cases reported from July to November in the years.

Table 6: Observed Entomological parameters during the survey.

Survey details			Pre- monsoon period	Post- monsoon period	Total
Total No.of Houses			28060	28060	56120
10% .of Houses			2806	2806	5612
Total No.of Houses Surveyed			2753	2755	5508
Breeding Habitats	Tyers	Nos.	51	111	162
		Pos.	2	9	11
	Tanks / Cisterns/Syntax	Nos.	203	237	440
		Pos.	17	17	34
	Drum / barrels	Nos.	3191	2228	5419
		Pos.	75	111	186
	Plastic Containers	Nos.	10451	9078	19529
		Pos.	86	62	148
	Grinding stone	Nos.	785	596	1381
		Pos.	11	16	27
	Flower pots	Nos.	7735	7318	15053
		Pos.	30	12	42
	Fridge	Nos.	2477	2277	4754
		Pos.	21	7	28
	OHT	Nos.	2525	2609	5134
		Pos.	0	1	1
	Sump	Nos.	1876	2153	4029
		Pos.	1	1	2
No. of Containers Checked			29294	26611	55905
No. of Containers Positives			243	236	479
No. of Houses Checked			2753	2755	5508
No. of Houses Positives			208	168	376
No. of Pupa			407	997	1404
Container Index			0.83	0.89	
House Index			7.56	6.10	
Breteau Index			8.83	8.57	
Pupal Index			14.78	36.19	

Every year during the period of July – November an upsurge in cases of dengue has been observed. A peak of the cases after monsoon depends with the season. It is not uniformly distributed throughout the year. The prevalence of serotype of dengue has not fully been studied in this area. However as per the information available serotype 2 and 3 are recorded so far. (unpublished information) the study of the serotype becomes important. the Aedes species of mosquitoes, Aedes aegypti has been incriminated as the vector of dengue in this area.(unpublished data of IVCZ, Hosur). The climatic conditions predominantly temperature and humidity play a vital role in the life cycle, breeding and longevity of the mosquito and transmission of the disease. The maximum temperature of this area ranges from 25°C to 27.5°C and the minimum ranges from 20°C to 20.8°C. The RH ranges from 11.33% to 59.33%. During summer months (pre

monsoon period) it ranges from 11.33% to 29.33%. During the monsoon and post monsoon period the RH range from 36.0% to 59.33%. As of now there is a significant association between temperature and humidity. The higher temperature and humidity has been noticed during the incidences of dengue. The location of Hosur is such that this place receives rains during both rainy seasons ie by the influence of South West monsoon and North East monsoon. The quantum of rain that is received by this area is more during South West monsoon than North East monsoon, for all purposes this area is under the influence of South West monsoon. The total number of rainy days in a year ranges from 203 to 211, but the quantity of rainfall is not heavy. It ranges from 35.04cm to 75.4cm. The undulating terrain of this area provides more number of breeding grounds for the mosquitoes in this area. However the containers and water storage tanks helps to maintain the breeding of the *Aedes* spp of mosquitoes in all seasons of the year.

CRITERIA FOR STRATIFICATION

Considering the prevalence of dengue in Hosur Municipal Corporation area at various degree in all through these years, the factors that influence the transmission and prevalence of dengue has been analysed with the following variables.

- a) Ward wise number of dengue cases.
- b) The potential breeding sources and the entomological parameters.
- c) The abiotic factors like rainfall, temperature, RH etc.
- d) Case detection (surveillance) and
- e) Intervention measures that are being carried out.

After analyzing the available data on each aspects noted above, the variables were given the weightage. Ward wise analysis was made and each ward is identified as low risk, medium risk and high risk area. A mapping has been done on this basis. Based on this 7 wards are considered as high risk, 16 wards as medium risk and 22 wards as low risk. The same has been shown in the map. (Fig.3). As observed from data, the prevalence of dengue in Hosur area is seasonal. To understand the exact trend of the disease whether endemic or epidemic the data for more years ie more than 10 to 12 years are required. It has been noted that the trend of dengue is not clear for Chennai city after analyzing the epidemiological data for 20 years.³ So it is not easy to define this area as endemic, but safely be considered this area as epidemic (dengue) prone. The interventional issues and challenges like population growth, rapid urbanization, which are also leading causes of the cyclic epidemiological pattern of dengue² in this area is notable here also. Further the temperature and humidity

suitable for vector mosquito supporting the transmission of dengue is also to be borne in mind and a routine control measures which include all key elements for the control of dengue, as recommended by the DPH&PM, Chennai⁴ must be adopted to free this area from epidemic prone status. There are variations in the characteristics of dengue epidemic from region to region. Hence information on all factors that favour the transmission of dengue is essential to identify the outbreak (epidemic). These information will be useful to plan suitable anti-dengue measures⁵. Taking the above observations into consideration this stratification of the area for dengue control has been attempted and recommended for adoption also. The outbreak of dengue fever in the coastal areas of Nagapattinam, Thiruvavur and Thanjavur Districts in Tamil Nadu during 2012 has been investigated and found that the dengue outbreak was seasonal, the entomological indices were high along with eco-bio-socio economic factors such as rainfall, good number of breeding sources.⁶ Similar conditions have been noticed in Hosur area also. The WHO recommends that every dengue endemic country should have a surveillance system and it should be mandated by law.¹ The same is lacking in our country, which makes our population vulnerable to dengue infections. Hosur area is not exceptional to this condition. Having observed the various factors related to dengue prevalence. Hosur area is stratified as High, Medium, Low risk area. The actions required is a holistic approach adopting the key elements that have been discussed here in the earlier paragraphs, A trial may be made in implementing strata wise activities to keep Hosur Municipal Corporation area free from dengue "out breaks".

CONCLUSIONS

The present study which was planned and executed has brought out that,

- The Hosur Municipal Corporation area is both vulnerable and receptive for Dengue out break and a seasonal incidence of dengue cases have been noticed during the last 5 years.
- The dengue incidence that has been reported from wards are not uniform.
- Epidemiologically, out of 45 wards in Hosur Municipal Corporation area, 23 wards needs greater attention to avoid seasonal incidence of the disease.
- All the wards are having potential breeding places for *Aedes* spp. Mosquitoes, all through the months of the year.
- The entomological parameters varies from one area to another, indicating the need of area specific control measures.
- The environmental conditions that includes the rainfall,

RH, Temperature etc., are conducive for the prevalence of the vector mosquito ie *Aedes* spp. Hence the vector control measures needs to be carried out on regular basis and not restricted to outbreak season only.

- The stratification done for Hosur Municipal Corporation area shows that by utilizing the available resources (ie man power and materials) it is feasible to avoid outbreak of Dengue when adopted / implemented. The Hosur Municipal Corporation Authorities may approach both the District Health Authorities and Institute of Vector Control and Zoonoses for technical guidance in dengue control, whenever required.

RECOMMENDATIONS

- The case detection mechanism is practically absent and it has to be taken up.
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- This key elements of the control measures such as surveillance, vector control, case management, IEC, Intersectoral co ordination, Community involvement, capacity building, monitoring and supervision are to taken up by the Local Body ie the Hosur Municipal Corporation's administration, as per the need of the time.
- In the absence of the surveillance for dengue, the services of the available staff (both the UPHC and Frontline workers in Health wing) may be utilized as a routine for dengue control. ie house visit, case detections (by referring the fever cases to Health / Medical Institution) source reduction and notification of the fever incidence. All private medical facilities should notify the dengue incidence to local health authority without fail.
- Both IEC and capacity building at Hosur Municipal Corporation level must be taken up to meet the outbreak situations.

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LIMITATION OF STUDY

Considering the available man power and materials this study was designed to cover both pre monsoon and post monsoon period of the years, 2020 and 2021. Since Hosur Municipal Corporation area is vast 10 wards out of 45 wards were selected randomly. The data of last five years ie 2015 - 2019 was considered for the proposed study and taken up for analysis. Considering the operational constraints the study has been limited for a short period.

CONFLICT OF INTEREST

Nil

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REFERENCES

1. Comprehensive Guidelines for Prevention and Control of Dengue and Dengue Haemorrhagic Fever -WHO (SEARO) 2015.
2. Kalpana Baruah, Amit Katewa, Gavendra Singh, Neeraj Dhingra (2020) Dengue Bulletin – Volume 41, 2020 149. Epidemiological stratification of dengue in India and strategic challenges.
3. Radhakrishnan J,a Selvakumar S,b Dhanraj B,b# Sanjeevi Prasad S, Samuel Tennysond (2020). Dengue Bulletin – Volume 41, 2020..Dengue In Chennai : a retrospective study.
- 4.Training Module for dengue, DPH & PM,Chennai-Publication-2019.
5. L. Kabilan, S. Balasubramanian1, S.M. Keshava1 and K. Satyanarayana (2005). Indian Journal of Pediatrics, Volume 72—November, 2005 .The 2001 dengue epidemic in Chennai
- 6.Praveen, BK Tyagi, Nirmal joe and M B Thakur. An outbreak investigation of dengue fever in the coastal areas of Nagapattinam, Thiruvavur,and Thanjavur Districts in Tamil Nadu,India during 2012. International journal of mosquito Research.

ANALYSIS OF MATERNAL MORTALITY IN CHENGALPATTU DISTRICT, TAMILNADU, MARCH 2017 – APRIL 2022, INDIA

Baranidharan B ⁽¹⁾, Vinili Simpson ⁽²⁾, Selvavinayagam T S ⁽¹⁾

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Abstract

BACKGROUND: Maternal mortality is the reflection of the Health care services and the support of the society to the women. Maternal mortality is usually ascribed to complications that generally occur during or around labour and cannot be predicted. The major causes of maternal mortality are hemorrhage, hypertensive disorders of pregnancy and sepsis. All those causes are preventable through early identification and prompt treatment.

METHOD: This Retrospective analysis was done for the maternal deaths occurred in Chengalpattu District from April 2017 to March 2022.

RESULTS : A fluctuating trend is being observed. MMR is peak in last 2 years. It was 18.96 during the period April 2019 to March 2020. Higher proportion of maternal deaths (64.6%) has occurred in the age group of 21 – 30 yrs. Majority of maternal deaths (74.7 %) have occurred in Government Medical College Hospital. Larger proportion of maternal deaths (69.6%) has occurred during the postnatal period. Majority of the deaths (43%) have occurred in post LSCS period. Major proportions of maternal deaths (55.7%) have occurred among the multigravida mothers. Among 57 deliveries majority (55.7%) of the birth were live birth. Majority of the maternal deaths (64.6%) are due to direct cause, which is highly preventable. Higher proportions of maternal deaths (31.4%) are due to PPH. Majority of maternal deaths (60.7%) are due to Covid followed by Heart disease complicating pregnancy (10.7%) and Anaemia (7.1%)

CONCLUSION : Overall Maternal mortality was 54.97/100000 live births. Last 2 years maternal mortality was high due to covid pandemic. The leading cause for maternal death in the District is hemorrhage followed by hypertensive disorders of pregnancy. These direct causes of deaths are potentially preventable by optimum utilization of existing MCH facilities, identifying the bottlenecks in health care delivery system, early identification of high risk pregnancies and complications and timely referral to tertiary care centre.

KEYWORDS : Maternal deaths, Postpartum Hemorrhage (PPH), maternal mortality, Antenatal care, Hypertension complicating pregnancies, postnatal care, maternal mortality ratio, anemia.

INTRODUCTION

Mothers play a vital role in the family, which is a powerful force for social cohesion and integration. Mothers are the backbone of the family. For the healthy development of a child, mother and child relationship is vital. Maternal deaths will considerably affect the development of the child as well the family, society and country. Although pregnancy is being considered as a normal physiological state, it carries risks of maternal morbidity and mortality.

World Health Organization (WHO) defines maternal death as “the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and the site of the pregnancy, from any cause related to or aggravated by pregnancy or its management but not from accidental or incidental causes”. Maternal mortality ratio is defined internationally as maternal deaths per 1, 00,000 live births in a specific period.

Much progress has been made in ending preventable maternal deaths in the past two decades: Globally the number of women and girls who die each year due to issues related to pregnancy and childbirth has dropped considerably, from 451,000 in 2000 to 295,000 in 2017,

a 38 per cent decrease. One of the most important goals of Sustainable Development Goals is to reduce maternal mortality. Sustainable Development Goals (target 3.1) says the global maternal mortality ratio should be less than 70 per 100,000 live births by 2030.

India's maternal mortality ratio (MMR) has improved to 103 in 2017-19, from 113 in 2016-18. This is according to the special bulletin on MMR released by the Registrar General of India March 14, 2022. The Government of India has been focusing on initiatives to improve maternal health indicators. Indicators for Antenatal care (ANC), institutional deliveries, C sections, distribution of IFA tablets, follow up of high-risk pregnancies, provision of postnatal and newborn care - have shown substantial improvement since 2005 (NFHS 4 & 5).



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Tamilnadu has achieved the Sustainable development Goals target. The maternal mortality ratio in Tamilnadu has significantly declined from 97(SRS MMR Bulletin 2007-09) to 60 (SRS MMR Bulletin 2016-18) per 1, 00,000 live births. The State has been able to provide RMNCHA+N services with major focus on primary and secondary care services under the NHM. Maternal mortality is just a tip of iceberg, behind each mortality there are at least 20 mothers who experiences severe morbidity. Direct obstetric causes like haemorrhage, hypertensive disorders of pregnancy, septic abortion and medical cause like hepatitis, heart disease in pregnancy are common causes of maternal death. Anaemia is the most important indirect cause of maternal mortality. As these causes are preventable by early detection of high risk factors and early intervention during pregnancy, and can help to reduce the maternal mortality.¹

It was in this context, this study was conducted with the objective to assess the existing MMR and the cause of maternal mortality over a period of 5 years in Chengalpattu District, Tamilnadu, India.

OPERATIONAL DEFINITIONS

1. Antenatal : It is the period from the date of conception to onset of labour pain
2. Intranatal : It is the period from the onset of labour pain to two hours after delivery.
3. Postnatal: It is the period from two hours of delivery to 42 days of delivery.

METHODS

The present study was a Retrospective analysis of the maternal deaths occurred in Chengalpattu District from April 2017 to March 2022.

Inclusion criteria : All maternal deaths from April 2017 to March 2022 were included in the study.

Exclusion criteria : All deaths due to non maternal cause were excluded from the study.

The line list maintained at the District level was used to ascertain the number of maternal death which included the data on age of the deceased mother, parity, period of death, place of death, cause of death. The results were analyzed with simple descriptive statistics and presented in frequency table and charts.

RESULTS

In the present study there were 79 maternal deaths for 1, 43,701 live births from April 2017 to March 2022.

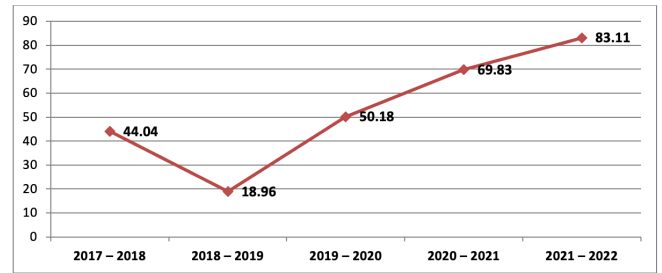


Figure: 1 Maternal Mortality Ratio (MMR) year wise

A fluctuating trend is being observed. MMR is peak in last 2 years. It was lowest (18.96) during the period 2019 to 2019 (Table 1). Maximum maternal deaths have occurred in 2021 – 2022, as 10 maternal deaths were due to covid. The MMR of the district was lower than the Sustainable development goals till March 2021.

Table: 1 Maternal Mortality Ratio (MMR) Block wise

S. No	Name of the Block	2016 - 17	2017 -18	2018 -19	2019 - 20	2020 - 21	2021 - 22
1	St. Thomas Mount	70.65	108.21	23.82	70.41	40.96	114.38
2	Kattankulathur	22.02	0	19.02	15.36	70.55	128.09
3	Thiruporur	43.1	82.78	40.39	73.37	59.97	33.1
4	Thirukazhukundram	162.01	0	0	0	78.49	41.44
5	Lathur	0	0	0	0	0	0
6	Chithamur	64.68	0	0	150.15	0	69.54
7	Acharapakkam	-	-	-	-	282.29	158.35
8	Zamin Endathur	-	-	-	-	165.47	0
9	Pallavaram	0	0	37.16	38.49	77.85	81.67
10	Tambaram	0	45.19	0	88.42	88.53	0
11	Chengalpattu	0	0	0	0	0	215.98
12	Madhuranthagam	-	-	-	-	0	0
	District MMR	50.66	44.04	18.96	50.18	69.83	83.11

Chengalpattu District has 8 Blocks and 4 major Municipalities. Acharapakkam Block, Madhuranthagam Block and Madhuranthagam Municipality were added in Chengalpattu District in the year 2019. Hence the data for the period 2017 to 2020 is not available. Lathur Block had no maternal deaths during the last five years and the MMR of the block is zero.

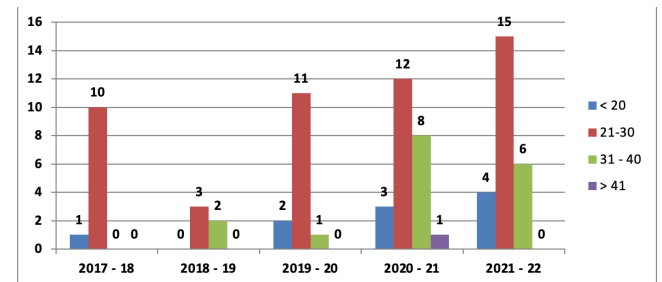


Figure: 2 Age wise distribution

Majority of maternal deaths (64.6%) have occurred in the age group of 21 – 30 yrs.

Majority of maternal deaths (74.7 %) have occurred in Government Medical College Hospital. Government Medical College Hospitals are teaching Institutes and tertiary care centres, so these institutes receive many complicated cases from secondary and primary care hospitals.

Table: 2 Place of death

Place of death	2017 - 2018	2018 - 2019	2019 - 2020	2020 - 2021	2021 - 2022	Total	Percentage
Home	0	0	0	0	0	0	0.0
Transit	1	0	1	2	3	7	8.9
PHC	0	0	0	0	0	0	0.0
GH	0	0	2	2	1	5	6.3
Govt. MCH	10	5	9	17	18	59	74.7
Pvt	0	0	2	3	3	8	10.1

No deaths in home reported, however 3 maternal deaths (one in each year 2019 – 2020, 2020 – 2021 and 2021 – 2022) reported in transit were the mother was on the way to hospital. During the year 2021 – 2022 (2 maternal deaths) transit deaths were high which was due to the referral of covid positive mother to higher centre. No maternal deaths reported in PHCs, however 2 maternal deaths (one in 2020 – 2021 and other in 2021 – 2022) reported in transit were referred from PHC.

Table: 3 Period of pregnancy at the time of death

Period of Pregnancy	2017 - 18	2018 - 19	2019 - 20	2020 - 21	2021 - 22	Total	Percentage
Antenatal	0	3	5	2	12	22	27.9
Intranatal	0	0	0	1	1	2	2.5
Postnatal	11	2	9	21	12	55	69.6

Higher proportion of maternal deaths (69.6%) has occurred during the postnatal period. 2 maternal deaths were reported in the intranatal period. During the year 2020 – 2021 one maternal death reported within 15 mts after delivery and in the year 2021 – 2022 one maternal death reported in intranatal period as the mother went for cardiac arrest and mother was taken up for perimortem LSCS. Postnatal care and follow up to be strengthened to reduce the maternal deaths in postnatal period. During the year 2017 – 2018 no maternal deaths reported among Antenatal Mothers. However during the year 2021 – 2022 maternal deaths among Antenatal mothers was high, which was due to covid.

Table: 3 Period of pregnancy at the time of death

Type of delivery	2017 - 18	2018 - 19	2019 - 20	2020 - 21	2021 - 22	Total	Percentage
Normal	3	1	3	9	4	20	25.3
LSCS	7	1	6	12	8	34	43.0
Assisted Vacuum	1	0	0	1	1	3	3.7

Majority of the deaths (43%) have occurred in post LSCS period. Since tertiary care institutions are referral centre, there is higher caesarean section. Caesarean section rate in our district is 55% which also accounts for the higher incidence of maternal death following caesarean section.

Higher proportions of maternal deaths (55.7%) have occurred among the multigravida mothers. In our district among the total AN registration, primi AN registration is 45% and multi AN registration is 55%. Since the percentage of AN

registration among multi mothers is more, the percentage of maternal deaths among the multi mothers also high. More maternal deaths were reported among Primi during 2020 – 2021 and 2021 – 2022, which was due to covid. Among the multi gravida mothers, 9 maternal deaths were HOB mothers (above G3).

Table: 5 Parity Index

Parity Index	2017 - 18	2018 - 19	2019 - 20	2020 - 21	2021 - 22	Total	Percentage
Primi	6	2	4	13	10	35	44.3
Multi	5	3	10	11	15	44	55.7

Among 57 delivered, majority (55.7%) of the birth were live birth. However, on analysing the outcome of pregnancy it was observed that 25% of the births are dead born.

Table: 6 Delivery Outcomes

Delivery Outcome	2017 - 18	2018 - 19	2019 - 20	2020 - 21	2021 - 22	Total	Percentage
AN	0	3	5	2	12	22	27.8%
Dead Born	6	0	4	1	2	13	16.5%
Alive Baby	5	2	5	21	11	44	55.7%

Majority of the maternal deaths (64.6%) are due to direct cause, which is highly preventable

Table: 7 Cause of maternal death

Cause of Death	2017 - 18	2018 - 19	2019 - 20	2020 - 21	2021 - 22	Total	Percentage
Direct Cause	8	2	13	16	12	51	64.6
Indirect Cause	3	3	1	8	13	28	35.4
Total	11	5	14	24	25	79	100.0

Higher proportions of maternal deaths (31.4%) are due to PPH. Following active management of third stage of labour universally and availability of oxytocics, the death due to hemorrhage can be reduced. Early identification and appropriate management of PPH will reduce maternal deaths.

Table: 8 Direct causes of Maternal death

Cause of Death	2017 - 18	2018 - 19	2019 - 20	2020 - 21	2021 - 22	Total	Percentage
PPH	4	1	4	2	5	16	31.4
Sepsis	4		2	2	1	9	17.6
PIH / HELLP / Eclampsia		1	3	9	2	15	29.4
Abortion			1		1	2	3.9
Amniotic Fluid Embolism / Pulmonar Embolism			2	3	2	7	13.7
Ruptured Ectopic			1			1	2.0
Adherent Placenta					1	1	2.0
Total	8	2	13	16	12	51	100.0

Table 9: Indirect cause of maternal deaths

Cause of Death	2017 - 18	2018 - 19	2019 - 20	2020 - 21	2021 - 22	Total	Percentage
Heart Disease	1		1		1	3	10.7
Anaemia	2					2	7.1
Viral Hemorrhagic Fever		1				1	3.6
Lymphoma 4th stage		1				1	3.6
Viral Pneumonia		1				1	3.6
Covid				7	10	17	60.7
TB Meningitis				1	1	2	7.1
Intra abdominal hemorrhage					1	1	3.6
Total	3	3	1	8	13	28	100.0

Majority of maternal deaths (60.7%) are due to Covid followed by Heart disease complicating pregnancy (10.7%) and Anaemia (7.1%)

DISCUSSION

The 5 year MMR for the District was found to be 54.97 per 100000 live births, which is lower than the state value 60/100000 live birth (SRS MMR Bulletin 2016 – 2018). On comparing with the national value 113/100000 live birth (Special Bulletin on MMR, RGI, 2022), the District MMR is significantly low and far better when compared with the MMR of 383/100000 live birth in 9 empowered action group state in India.²

In this study majority (64.6%) of the maternal deaths were in the age group of 21 – 30 years, and decreased sharply with age. A similar finding was reported by Sridevi et.al³ on analysis of maternal mortality in GMKMCH Salem as 50.98% of the maternal deaths were reported in the age group of 21 – 30 years. The legal age for marriage is 21 years. Hence, more number of births is being reported in this age group. In this present study higher proportions (69.6%) of the death have reported in Government Medical College Hospitals. Since Government Medical College Hospitals are the tertiary care hospitals with all facilities pooled in one institution, all the high risk and complicated mothers are referred to these institutions. In our district around 55% of the mothers are delivered in Government institution. Among the government institution delivery 71% of the deliveries are occurring in Government Medical College Hospitals.

On analyzing the data 69.6% of maternal deaths have occurred in the postpartum period which is comparable with the findings by Patel D et.al⁴ showed 69.23% deaths in the postpartum period. Our study highlights 43% of maternal deaths occurred following Caesarean section. Similar results was observed in a study conducted by Shobha et.al⁵ which showed 88.5% of maternal deaths were following Caesarean section. Maternal deaths were more observed in multigravida women (55.7%) as compared to primigravida women (44.5%). Similar findings have been reported in other Indian studies too. Garg P et.al⁶ reported 75%, Yadav et.al⁸ reported 82% and Badra B et.al⁹ reported 60 % of maternal deaths in multigravida women. In our study out of 57 birth occurred, 44 (55.7%) were live birth. Our finding was consistent with the study findings by Patel D et.al⁴ who reported 64.10% live births. As far as the causes of maternal death are concerned, 64.6% of the maternal deaths were due to direct Obstetrical cause and 35.45% were due to indirect causes. Similar findings were observed in other study by Badra et.al⁹ and Yadav et.al.⁷

Among the direct causes of death, the majority were due to hemorrhage 31.45% followed by hypertensive disorders of pregnancy 29.4%. Hemorrhage was the major cause of maternal deaths reported by other Indian studies too.^{8,9} However Horwood et.al² reported equal proportion of hemorrhage and hypertensive disorders of pregnancy for maternal deaths. In few studies Behuria et.al¹⁰ and Para S et.al¹¹ have reported Hypertensive disorders of pregnancy as the major cause for maternal mortality.

On analysis of data, it was observed that women who died of obstetric hemorrhage related cause has been identified in late stage or in the stage of irreversible shock. For such patients, shock index (Heart rate/systolic Blood Pressure) can be a useful guide. A score of <0.9 indicates low risk whereas score of >1.4 indicates urgent intervention.¹² In addition, the use of Non Pneumatic Anti Shock Garment (NASG) suite while transferring the mother from a primary care level to tertiary care is also proved beneficial. Basic procedures like Active Management of third Stage of labour (AMSTL), early detection of postpartum hemorrhage, appropriate use of Oxytocics, monitoring of third stage of labour, intravenous fluids, blood and blood products and timely surgical intervention has been enforced in use and again it is reinforced as a crucial step to prevent hemorrhage related maternal deaths. Such trainings need to be continued. On the other hand, we found that Hypertensive disorders of pregnancy were the next leading cause of death. We observed that early recognition of preeclampsia, continuous monitoring both in field and institution level, use of appropriate anti hypertensives and rationale use of Magnesium sulphate, as well as timely referral and delivery could help in the incidence.

CONCLUSION

Maternal mortality ratio in the district is in fluctuating pattern. Majority of the maternal deaths were in the age of 21 – 30 yrs, multigravida, postnatal period and following caesarean section. Hemorrhage, hypertensive disorders of pregnancy and sepsis are leading causes of maternal deaths. Most of these maternal deaths are preventable if patients are given appropriate treatment at periphery and timely referred to tertiary care centre. Higher proportions of deaths were occurred in covid pandemic period in first and second wave. Among the non maternal causes heart disease complicating pregnancy and anemia were the leading cause.

RECOMMENDATIONS

Many maternal mortality and morbidity are preventable. Early AN registration, regular antenatal care, early

identification of high risk factors, complication, timely management and referral to the tertiary care institution for management and delivery are essential. Creating awareness among the public about the health care facilities available in various levels and also educating them about the warning signs which they need to seek medical care and intervention. Maternal deaths should be reviewed at all levels to identify the bottlenecks for further prevention of maternal deaths. Maternal death audit should be focused on identifying the delays in recognizing complications, decision in seeking medical care, reaching a medical facility with adequate care and receiving quality care at the facility. Nutrition, education, and empowerment of girl child are the need of the hour. Maternal mortality can be reduced considerably by late marriage, contraceptive use, spacing pregnancy and limiting family size. It is the responsibility all health care professionals to ensure the health of all mothers and newborn survival as the mother and child play a crucial role for the future generation and community.

LIMITATIONS

We analysed the maternal deaths occurred among the mothers registered in our District, which cannot be generalized. A prospective study can be replicated including the demographic variables influencing maternal health.

CONFLICTS OF INTEREST : NIL

REFERENCES

1. Khandale SN, Kedar K. Analysis of maternal mortality: a retrospective study at tertiary care centre. *Int J Reprod Contracept Obstet Gynecol* [Internet]. 2017;6(4):1610. Available from: <http://dx.doi.org/10.18203/2320-1770.ijrcog20171437>
2. Horwood G, Opondo C, Choudhury SS, Rani A, Nair M. Risk factors for maternal mortality among 1.9 million women in nine empowered action group states in India: secondary analysis of Annual Health Survey data. *BMJ Open* [Internet]. 2020;10(8):e038910. Available from: <http://dx.doi.org/10.1136/bmjopen-2020-038910>
3. Sridevi G, Shanmugavadivu L. Analysis of maternal mortality at a government teaching hospital GMKMCH, Salem, Tamil Nadu, India: a retrospective study. *Int J Reprod Contracept Obstet Gynecol*. 2018;7:5093–6.
4. Patel DM, Patel MM, Salat VK. Two year review of maternal mortality at a tertiary care hospital of GMERS, Valsad, Gujarat, India. *Int J Reprod Contracept Obstet Gynecol* [Internet]. 2018;7(6):2283. Available from: <http://dx.doi.org/10.18203/2320-1770.ijrcog20182336>
5. Shobha, Kanavi JV, Divater VB, Thomas A. Review of maternal mortality in a tertiary care urban teaching hospital: 10 year retrospective study. *Int J Reprod Contracept Obstet Gynecol* [Internet]. 2019;8(5):2050. Available from: <http://dx.doi.org/10.18203/2320-1770.ijrcog20191965>
6. Garg DP, Assistant Professor, Department of Obstetrics and Gynecology, Gajra Raja Medical College, MP, India. To study maternal mortality and complications leading to maternal death in the tertiary care centre. *Int J Med Res Rev* [Internet]. 2016;4(3):347–52. Available from: <http://dx.doi.org/10.17511/ijmrr.2016.i03.10>
7. Yadav A, Prakash A, Sharma C, Saha MK, Yadav S, Baghel J, et al. Maternal mortality in the remote islands of India-unraveling the conundrum. *J Family Med Prim Care* [Internet]. 2022;11(2):733–8. Available from: http://dx.doi.org/10.4103/jfmpc.jfmpc_1365_21
8. U. S, Nair S. Trends in causes of maternal mortality in a tertiary care centre in Kerala, India. *Int J Reprod Contracept Obstet Gynecol* [Internet]. 2018;7(11):4370. Available from: <http://dx.doi.org/10.18203/2320-1770.ijrcog20184229>
9. Khumanthem PD, Chanam MS, Samjetshabam RD. Maternal mortality and its causes in a tertiary center. *J Obstet Gynaecol India* [Internet]. 2012;62(2):168–71. Available from: <http://dx.doi.org/10.1007/s13224-012-0169-1>
10. Behuria S, Puan JN, Ghosh S, Nayak BS. Study of maternal mortality in a tertiary care hospital in a tribal KBK area of Odisha, India. *Int J Reprod Contracept Obstet Gynecol* [Internet]. 2020;9(4):1528. Available from: <http://dx.doi.org/10.18203/2320-1770.ijrcog20201217>
11. Para S, Singh P, Malik R, Nanda S. Maternal mortality trends in “Tropical Country.” *Int J Clin Obstet Gynaecol* [Internet]. 2020;4(2):71–4. Available from: <http://dx.doi.org/10.33545/gynae.2020.v4.i2b.506>
12. Pandya ST, Mangalampally K. Critical care in obstetrics. *Indian J Anaesth* [Internet]. 2018;62(9):724–33. Available from: http://dx.doi.org/10.4103/ija.IJA_577_18

ORIGINAL ARTICLE - PUBLIC HEALTH

A TRAINING ON SELF BREAST EXAMINATION AMONG WOMEN ATTENDING RURAL HEALTH AND TRAINING CENTRE OF A MEDICAL COLLEGE

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INTRODUCTION : Breast cancer is of global health concern and a leading cause of morbidity and mortality among women. Studies have shown that in most of the developing nations, breast cancer is diagnosed in advanced stages of the disease and thus has a poor outcome and high fatality rate. Therefore, Breast self-examination (BSE) has been identified as the only realistic approach in early detection of breast cancer in developing nations.

OBJECTIVES : To encourage the participants to perform Self Breast Examination at their residence.

To follow up the participants after 15 days for assessment of their training and for queries.

METHODS : The study was conducted among 100 women of 35 years and above attending a rural health and training centre. They were given a basic training on self breast examination. Following which, they were followed up on the confidence of Self Breast Examination.

RESULTS : 84 % women tried self breast examination at their residence after this training. 87 % of the women were competent enough to perform self breast examination on their own. 42 % of women were confident to train self breast examination to their mother/mother in law and daughters.

CONCLUSION : A high proportion of women tried self breast examination at their residence, were competent enough to perform self breast examination on their own and were confident to train self breast examination to others. Hence, this training program on a long run will help in early detection of breast lump.

INTRODUCTION

Breast cancer is the country's leading cause of cancer among women. With increasing cases of breast cancer every year, there is a prompt need for the prevention and early detection. Many women are still not aware about the techniques available in the early detection of breast cancer. Even though aware of it, they are not willing to spend for the recommended screening mammogram. Some are even hesitant to go to the hospital for screening. Hence, in order to overcome this, the concept of self-breast examination will be very helpful in early detection of breast neoplasms. This training will be easy to understand even for illiterate women.¹ This youtube video on training of Self Breast Examination was developed under the guidance of Professor of Pathology, Incharge of Virtual Training in Medicine, AIIMS, New Delhi under NICPR- ECHO project (National Institute of Cancer Prevention and Research-Extension for Community Healthcare Outcomes) which is a knowledge sharing tool that shares knowledge through experts. Most of the breast cancers that are detected in the very early stage by a self-breast examination are not detectable by mammography.³

Studies have shown that in most of the developing nations, breast cancer is diagnosed in advanced stages of the disease and thus has a poor outcome and prognosis.⁴

Self-breast examination is proposed as an inexpensive, non-invasive, and easily accessible means of promptly identifying early-stage breast neoplasms.⁵ The method involves the woman herself looking at and feeling each breast for possible lumps, distortions or swelling.

However, the earlier that breast cancer is detected, the more treatment options are available and the greater the chance of recovery. The percentage of young women who suffer from risk factors of breast cancer are very high.⁶ Hence, this self-breast examination should begin at an early age especially for the high risk groups. Though women are aware of the self breast examination, they are not aware neither of the benefits nor the step-wise procedure involved in the self breast examination and its role in prompt detection of early stage breast neoplasms. Hence this study was aimed to encourage participants to perform self breast examination at their residence.

Follow up of the participants after 15 days was done to



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know whether this training stood as a motivation for them to perform self breast examination on a regular basis.

MATERIALS AND METHODS

TYPE OF THE STUDY : Cross sectional study

SITE OF THE STUDY : The study was conducted among the women 35 years and above attending the out-patient department at Rural health training center of Sri Ramachandra Medical College & Research Institute.

PERIOD OF THE STUDY : Duration of the study was 6 months.

SAMPLE SIZE : Based on review of literature, about 80 % of the participants of the study were competent in self breast examination after training.

Based on this, sample size was calculated.

$$\frac{4 \times 80 \times 20}{8 \times 8} = 100$$

INCLUSION CRITERIA : Women in the age group of 35 years and above

EXCLUSION CRITERIA : Women with amastia.

Breastfeeding women. Women with symptoms of cyclical mastalgia.

ETHICAL ISSUES, IF ANY : Study was initiated after obtaining permission from the Institutional Ethics Committee of Sri Ramachandra University of Higher Education and Research. The study involves administering a short questionnaire and a brief training. Data was collected after obtaining written informed consent from the participants. The information collected from the participants was and will be kept confidential.

METHOD OF TRAINING FOR SELF BREAST EXAMINATION

Expert opinion regarding various training procedures for Self-Breast Examination were sought for the best training module like video demonstration and explanation.

- Duration of the video content- 4 mins 56 secs (4:56)
- The content was developed by Incharge of Virtual Training in Medicine department, AIIMS, New Delhi.
- The video was based on tamil language.
- The content of the video was validated by experts in the field of General Surgery. Prior to the start of the study, about 10 women , who were not included in the study were selected randomly from the outpatient department of rural health and training centre. They have been shown the video of self breast examination. They were able to understand the video easily.
- It was an animated video.
- Informed consent was obtained from the study participants.

The video explains about

- the symptoms of breast cancer.
- the demonstration of 5 steps of self-breast examination involving various positions and methods.
- the importance of palpation of axilla.
- the benefits involved in self breast examination.
- the age to begin self-breast examination.
- the frequency and timing to perform self-breast examination.
- how to feel an abnormality in the breast.
- whom to report or consult in case of any abnormality felt on this examination.

Important things to be noted in self-breast examination, highlighted in the video includes :

1. Any changes in the breasts, including their look,feel or size.
2. Changes in the nipples look or feel.
3. Dimpling or puckering on the breast skin.
4. Hard or thick lumps underneath the breast skin or deep within the tissue.
5. Pain in the breast or on any particular area of breast.
6. Discharge from the nipple.
7. Retraction of nipple.
8. Rashes in or around the breast.
9. Warmth,redness or dark spots on one or both breasts.

The participants were comfortable in understanding the video. Their queries regarding the self-breast examination were addressed.

The importance of this examination in early detection of breast neoplasms was clearly explained and the study participants were requested to take forward the training given to their mother/mother-in-law and other women at home. Importance of the self-understanding of the benefits in this examination were also explained.

Questions on follow up and the knowledge gained post training on self-breast examination using a semi-structured questionnaire:

- | | |
|---|--------|
| 1. Did you go home and try self-breast examination? | a. yes |
| | b. no |
| 2. Are you able to perform self-breast examination as trained? | a. yes |
| | b. no |
| 3. Did you try explaining it for other women at your house? | a. yes |
| | b. no |
| 4. Have you understood the importance of self-breast examination? | a. yes |
| | b. no |
| 5. Will you do self-breast examination on a Regular basis? | a. yes |
| | b. no |

Social desirability bias is possible and we tried our best to minimise it by keeping all the follow up questions non-

threatening and non-embarrassing. In order to avoid the participants discomfort of conscious answering to the questions in front of the audience, a separate one-to-one follow up was done for all the study participants.

RESULTS

The participants were comfortable in understanding the video.

The study participants were followed up after 15 days. They were enquired about the impact of the training program. Their knowledge and confidence gained post training session was assessed. They were asked about their sharing of this knowledge and the training program to other women at house.

- 84 % women tried self-breast examination at their residence after this training
- 81 % of the women were competent enough to perform self breast examination on their own.
- 42 % of women took forward and explained the training program to other women at house.
- 58 % of women though aware of the training, didn't explain to other women at house.

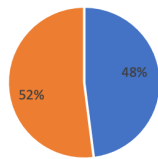


Figure 1: Percentage of women who took forward and explained training

There is reasonably good uptake of the training program by the study participants to other women at their house (mother, mother-in-law). The reason women must do self-breast examination is to learn what's normal for their breasts. Importance of this examination must be known by all the women in the house, as genetic factors play a role in the development of the breast neoplasms.

DISCUSSION

Many women report that the first sign of their breast cancer was a new breast lump, which they discovered on their own by doing self-breast examination.

This is the reason, that this training of self-breast examination is recommended for them to be familiar with the normal consistency of their breasts. This familiarity will help them realize any abnormality if found to be reported promptly. A high proportion of women tried self breast examination at their residence, were competent enough to perform self breast examination on their own and were

confident to train self breast examination to others after this video based training.²

Especially for women in low resource settings, due to the lack of access to diagnostic facilities, it is essential to educate them with self-breast examination as an important and primary modality for screening.³

This examination being simple, quick and cost free, it can be performed by every woman on a routine monthly basis easily. Enough motivation and encouragement are to be given to them to perform this examination for their own benefit. This can be done privately without any aid or the assistance of medical personnel.

Hence, this program on a long run will help in early detection of breast lump. Therefore, many such training programs can be implemented effectively to motivate and encourage women especially in certain rural areas where access to mammography and other techniques are limited. Thus, prevention is better than cure.

REFERENCES

1. Budakoglu II, Maral I, Ozdemir A, Bumin MA. The effectiveness of training for breast cancer and breast self-examination in women aged 40 and over. J Cancer Educ. 2007;22(2):108–11.
2. AIIMS Self Breast Examination (Tamil) [Internet]. 2020 [cited 2022 Nov 29]. Available from: https://www.youtube.com/watch?v=_OEPTwoKHxw
3. Nimir A, Al-Dubai S, AL-Shagga M, Saliem A. Knowledge and practice of breast self-examination among students in a private higher learning institution in malaysia. Malaysian Journal of Public Health Medicine. 2014 Nov 21;14:47–53.
4. Akram M, Iqbal M, Daniyal M, Khan AU. Awareness and current knowledge of breast cancer. Biol Res. 2017 Oct 2;50(1):33.
5. Tewelde B, Tamire M, Kaba M. Breast self-examination practice and predictors among female secondary school teachers in Addis Ababa, Ethiopia: using the health belief model. BMC Womens Health. 2022 Jul 29;22(1):317.
6. Memon ZA, Kanwal N, Sami M, Larik PA, Farooq MZ. Risk of Breast Cancer among Young Women and Importance of Early Screening. Asian Pac J Cancer Prev. 2015;16(17): 7485–9.

A STUDY ON COGNITIVE DEVELOPMENT AND BEHAVIOURAL PROBLEMS AMONG SPECIAL NEEDS CHILDREN

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Abstract

BACKGROUND: Special needs children have various health problems and most common is impaired cognitive development and behavioural problems. The cause and management of behavioural problems in special needs children have not been established. It has been previously reported that some behavioural problems may be related with cognitive development.

OBJECTIVE: To assess the cognitive development and behavioural problems of the special needs children and assess the health seeking behaviour of the special needs children.

METHODS: The study was conducted among 46 special needs children at Special children home. After collecting basic socio demographic details, they were assessed for cognitive development and behavioural problems using 5-15R questionnaire for 2-5yrs & 5-17yrs and their health seeking behaviour using a semi structured questionnaire followed by General and Clinical Examination.

RESULTS: Out of these 46 special needs children, 69.5% were male and 30.5% were female. The mean age was 11.69 + 4.62 years. In Cognitive development, problem in motor skills were present in 39.13% of children; lack of attention present in 45.65% of children; lack of perception present in 60.86% of children; lack of memory present in 63.04% of children; problem in language present in 52.17% of children; problem in learning & problem solving skills present in 67.39% of children. In Behavioural problems, problem in social skills present in 52.17% of children and emotional problems present in 17.39% of children. Among them 37% seek Government healthcare facility for cognitive development and behavioural problems. A referral advice was provided to necessary children.

CONCLUSION: A high proportion of the special needs children were having problems in motor skills, attention, perception, memory, language, learning & problem solving skills, social skills and emotional problems which needed to be addressed. Interventions should be aimed at improving the cognitive development and behavioural problems of the special needs children.

KEYWORDS: Cognitive development, Behavioural problems.

INTRODUCTION

Special needs children are those who have problems in physical, developmental, behavioural and emotional conditions. These children require utmost care and attention, continuous monitoring of their health and wellbeing when compared to normal children. Historically programs and prevention efforts for these children were limited.

The programs covering these special needs children under Maternal and Child Health (MCH) and Children With Special Health Care Needs (CSHCN) were responsible for planning and developing health care systems and providing health services to them. So health plans serving the purpose of monitoring and quality assurance of these special needs children should be developed.¹

In India, there are 2.19 crore disabled individuals in India constituting 2.13 % of the total population according to 2001 Census and UNICEF reports that around 30 million children in India suffer from disability. But the actual number of special needs children may increase two or three times from the recent available data.

The Government has great challenges like shortage of trained manpower for the empowerment of the special needs

children. The Government in collaboration with supportive organizations working under CSR / NGOs / DPOs & also with the help of Special Schools and parents can fulfil the needs of the special needs children.²

Health Seeking Behaviour is a decision making process to seek perfect treatment for health (J. Olenja, 2003). It is governed by multiple factors. The Special needs children are at increased risk of having unmet health needs when compared to normal children.^{3,4} Health seeking behaviour has emerged as a tool to tackle ill health by taking remedial actions and people are being encouraged to learn and use health promoting behaviours.⁵

OBJECTIVES

- To assess the cognitive development and behavioural



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problems of the special needs children.

- To assess the health seeking behaviour of the special needs children.

MATERIALS AND METHODS

STUDY DESIGN : Cross sectional study

STUDY AREA : The study was conducted among the special needs children attending a special children home at the Rural health training center field practice area of Sri Ramachandra Medical College & Research Institute.

STUDY PERIOD : The study was conducted during August and September 2022.

SAMPLE SIZE : As the study was conducted among the special needs children who comes under special group, the study was decided to be conducted at the Rural health training center field practice area of Sri Ramachandra Medical College & Research Institute. The number of special children home at the Rural health training center field practice area of Sri Ramachandra Medical College & Research Institute was surveyed and found to be only one special children home. After obtaining permission from the special children home and informed consent from the parents/guardians, all the special needs children were included in the study. Based on this, the Sample size of the study was 46.

INCLUSION CRITERIA : All clinically confirmed and certified special needs children attending the special children home.

EXCLUSION CRITERIA :

- No exclusion criteria.

ETHICAL CONSIDERATIONS : Study was initiated after obtaining Ethics approval from the Institutional Ethics Committee of Sri Ramachandra University of Higher Education and Research. Permission was obtained from the special children home for conducting the study. After obtaining informed consent from the parents/guardians of the special needs children, the data was collected on basic socio demographic details using a semi structure questionnaire. The special needs children were assessed for cognitive development and behavioural problems using 5-15R questionnaire for 2-5yrs & 5-17yrs. The health seeking behaviour of the special needs children were collected from the parents/guardians using a semi structured questionnaire followed by General and Clinical Examination. The information collected from the participants was kept confidential.

PLAN FOR ANALYSIS : The data was collected and entered using Microsoft Excel. Statistical analysis was done using Statistical Package for Social Science (SPSS) version 16 software and the results were tabulated.

HEALTH SEEKING BEHAVIOUR

The parent/guardian of each study participant was enquired individually regarding their health seeking behaviour. They were asked about whether they seek healthcare services for their health needs.

If they seek healthcare facility then they were asked about their preference of healthcare facility for health problems like general ailments or sick, respiratory problems, gastrointestinal problems, severe neurological illness like seizures, problems in cognitive development including motor skills, attention, perception, memory, language, learning & problem solving skills, behavioural problems including social skills and emotional problems.

If they seek public healthcare facility, then they were asked about government hospital or government primary health centre. If they seek private healthcare facility, then they were asked about private hospital or private clinic.

They were also enquired about getting the drugs over the counter from pharmacy directly and also whether they seek other system of traditional medicine like ayurvedha, siddha, homeopathy, unani, etc.

If they do not seek healthcare facility for health problems then they were asked about whether they were able to manage the health problems themselves through home remedies or they consider it was not a major problem or they were not aware or they were not affordable or other issues for not seeking healthcare facility and their responses were recorded.

RESULTS

The study participants were 46 special needs children, out of which 69.5% were male and 30.5% were female. The mean age was 11.69 ± 4.62 years.

In Cognitive development, problem in motor skills were present in 39.13% of children; lack of attention present in 45.65% of children; lack of perception present in 60.86% of children; lack of memory present in 63.04% of children; problem in language present in 52.17% of children; problem in learning & problem solving skills present in 67.39% of children.

In Behavioural problems, problem in social skills present in 52.17% of children and emotional problems present in 17.39% of children.

Among them 37% seek Government healthcare facility for cognitive development and behavioural problems but could not obtain the details of the same.

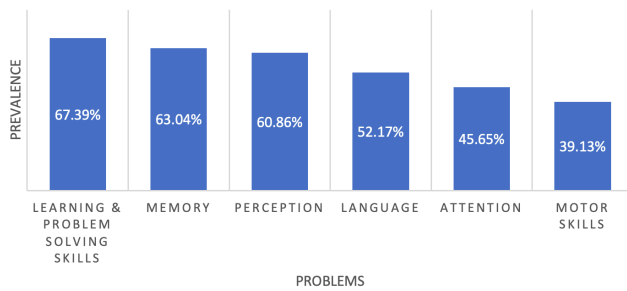


Figure 1: Prevalence of Cognitive Developmental Problems

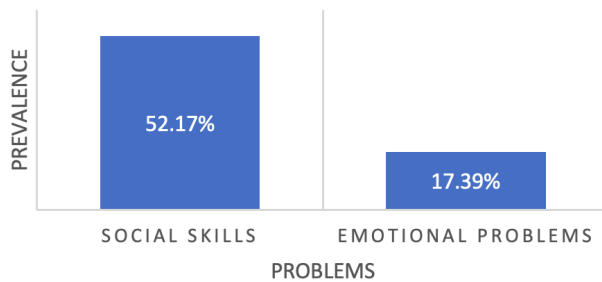


Figure 2: Prevalence of Social and emotional Problems

DISCUSSION

The study mainly focused on cognitive development, behavioural problems and the health seeking behaviour of the special needs children. The domains of cognitive development assessed were motor skills, attention, perception, memory, language, learning & problem solving skills. In behavioural problems, social skills and emotional problems were assessed. The results of the study showed that majority of the special needs children have problems in cognitive development and behavioural problems. A referral advice was provided to necessary children. As our objective was to assess the cognitive development and behavioural problems we have limited to descriptive analysis. The study can be further extended to association analysis in future.

The literature search regarding health seeking behaviour of the special needs children showed that they have greater frequency and length of hospital admission when compared to normal children (Mahon and Kibirige, 2004). It was considered important to identify the needs of the special needs children and provide necessary training environments and services so that they become independent and productive members of the society (Kircaali-Iftar, 1998; Sahbaz, & Kalay, 2010). The Government primary health centres being the public health care facility for rural population were most often located at a distance from villages. The education status and awareness of the parents/guardians determine their health seeking behaviour. The healthcare infrastructure

and healthcare utilisation determines the health-seeking behaviour of the population and was found to be significantly lower in the rural area.⁶⁻¹⁰

Most commonly, mothers are the primary caregivers to the special needs children and they need sufficient knowledge to recognize the danger signs earlier for effective health outcomes. Hence giving health education to mothers has better health outcomes as they take utmost care of the special needs children.

The limitations of this study were the cause and management of behavioural problems in special needs children have not been established and it has been previously reported that some behavioural problems may be related with cognitive development which can be studied further. As the study was conducted in one special children home, it can be further extended to two or more such special children homes for generalisability.

CONCLUSION

A high proportion of the special needs children were having problems in motor skills, attention, perception, memory, language, learning & problem solving skills, social skills and emotional problems which needed to be addressed. Interventions should be aimed at improving the cognitive development and behavioural problems of the special needs children. Health education to mothers has better health outcomes.

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We would like to express our sincere gratitude to the study participants, parents/guardians and caregivers of the special children home.

CONFLICT OF INTEREST

There is no conflict of interest to be declared.

REFERENCES

1. McPherson M, Arango P. A new definition of children with special health care needs. *Pediatrics*. 1998;102(1):137-40.
2. Arya RK. Education of children with special needs: A critical Analysis with special reference in Chhattisgarh state of India. *Eur Acad Res*. 2013;1(6):831-54.
3. Newacheck PW, Strickland B, Shonkoff JP, Perrin JM, McPherson M, McManus M, et al. An epidemiologic profile of children with special health care needs. *Pediatrics*. 1998;102(1):117-23.

4. Prakash LKP. Acute respiratory infection among children and health seeking behaviour in India. *Int J Sci Res Publ.* 2014;4(11):1.
5. Chandwani H, Pandor J. Healthcare-seeking behaviors of mothers regarding their children in a tribal community of Gujarat, India. *Electron Physician.* 2015;7(1):990.
6. Avis M, Reardon R. Understanding the views of parents of children with special needs about the nursing care their child receives when in hospital: a qualitative study. *J Child Health Care.* 2008;12(1):7–17.
7. Gul SO, Vuran S. Children with special needs' opinions and problems about inclusive practices. 2015;
8. Burtcher D, Burza S. Health-seeking behaviour and community perceptions of childhood undernutrition and a community management of acute malnutrition (CMAM) programme in rural Bihar, India: a qualitative study. *Public Health Nutr.* 2015;18(17):3234–43.
9. Islary J. Health and health seeking behaviour among tribal communities in India: A socio-cultural perspective. *J Tribal Intellect Collect India.* 2014;1–16.
10. Yadav R, Zaman K, Mishra A, Reddy MM, Shankar P, Yadav P, et al. Health Seeking Behaviour and Healthcare Utilization in a Rural Cohort of North India. In: *Healthcare.* MDPI; 2022. p. 757.

PRIMARY HEALTH CARE SERVICES IN URBAN AREAS OF TAMIL NADU – BACKGROUND, SWOT ANALYSIS AND RECOMMENDATIONS

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Abstract

ABSTRACT: Indian is witnessing the challenge of urbanizing trend and Tamilnadu is leading the phenomenon with significant proportion of slum population. The urban poor are most vulnerable and SDG indicators for them shows unfavorable results. The framework of urban health system is also changing with introduction of NUHM. Improvement in civil infrastructure, provision of human resources for the health with well-coordinated urban health governance are the key priority areas to improve the service delivery.

KEYWORDS : Urban health, governance issues, public health cadre, Wellness centres

BACKGROUND

India is witnessing rapid urbanization, with proportion of urban population doubling from about 18% in 1960 to 34% in 2019.¹ In ten years between 2001 and 2011 there was a net increase of almost 100 million people in urban areas. In Tamil Nadu 48.5 percent of population lives in urban areas when compared to the national average of 31 percent.² Urban population growth in the state (at 27 percent during 2001-11) outpaced rural population growth (6 percent during the same period) and overall urban population in Tamil Nadu could have exceeded rural population at present. Also, while urban population in Tamil Nadu grew by 27 percent, reported slum population has doubled from 28.38 lakh to approximately 59 lakhs, in the same period between 2001 and 2011.

Urbanization is often characterized as beneficial for economic and social growth. But there is growing evidence on the disproportionate burden of disease and ill-health among the urban poor compared to non-poor households in urban areas.³ Life expectancy among the poorest is lower by 9.1 years and 6.2 years among men and women, respectively, compared to the richest in urban areas. Unhygienic living conditions, environmental pollution, increased exposure to accidents, high proportion of out of pocket expenditure by households in lowest wealth quintile are distinct problems among urban poor. It is necessary to have disaggregated data for urban areas to understand and address the health inequalities among different sections of the urban population.

Health system in Tamil Nadu strives to address public health through the robust infrastructure and effective

public health initiatives. The state is aiming to provide health services which are easily accessible to the public. Nationally, despite the availability of services, there is large inequality in distribution, access, and affordability within the urban areas and between rural and urban areas.

Evolution of Public Health System in Urban areas

Historically the urban health systems in most cities of India were developed in context of containment of epidemic disease control. In Tamil Nadu, the primordial public health determinants like providing safe water, sanitation and drainage system were taken care by the sanitary wing of the local bodies usually headed by the Health Officer or Sanitary officer or Sanitary Inspector under the overall supervision of the Municipal Commissioner. The preventive public health was equated mostly with environmental sanitation and vaccination services for life threatening communicable diseases. The government run general hospital in the cities and towns gave the secondary and curative care to the public. The dispensary and maternity homes of local bodies gave the institutional outpatient care and MCH services. In between large number of private players provide curative services. The primary preventive care was lost among them unlike their



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rural counterparts. The rural health statistics states that, there is 44 percent shortfall of PHCs in urban areas as required the norms. In Tamilnadu, there are the rural areas are saturated with PHCs compared to 43 percent shortfall in urban areas.⁴

The 'urban health system' is fragmented, fragile and poorly governed, with blurred lines of responsibility and accountability between multiple government and private agencies.⁵ The model of British era urban planning such as keeping away the barracks and core city at a safe distance from the public to keep away the contagious diseases has affected the process of urbanization in most of the cities in India.⁶ Additionally, the unequal growth in the size of urban towns and cities, the governance structures in the Urban health are not uniform unlike their rural counterparts. Their role was limited to control of communicable Diseases like Cholera, Plague, flu pandemics of British era. With successful eradication of few communicable diseases, the growing importance of Maternal and Child Health Services, the evolution of Non-Communicable Diseases including Mental Health, the face of preventive urban health services needs to get transformed.

Urban Health and Tamil Nadu Public Health Services

The Public Health Department, formerly called the Sanitation department, was started way back in 1923 with an objective of controlling communicable diseases, specifically cholera and smallpox by provision of improved sanitation and vaccination respectively. Off late from the 1970s, Maternal and Child Health services, especially Family Welfare programmes has gained greater importance leading to a greater improvement in MCH indicators. In the last two decades, the burden due to non-Communicable disease like cardiovascular diseases, mental disorders, etc., as evident from Global Disease Burden⁷ study by ICMR, has put more stress on the OOPE by the public. It has been observed that urban areas have a higher communicable disease incidence, malnutrition, lower immunization coverage threat than rural areas, due to high population density, overcrowding and pollution.⁸⁻¹¹ The incidence of Dengue, Malaria and Chikungunya are higher in Urban and peri urban areas when compared to rural areas. Presently, keeping in line with the Sustainable Development Goal Indicators, the three major service areas of the public health department include Communicable disease control, Maternal and Child Health services including immunization & Family Welfare, Non-Communicable disease control including mental health.

The public health services are delivered in urban areas through the Urban Primary Health Centres with support of the concerned urban local bodies. The UPHCs were established as per recommendations of Technical Resource Group on implementing National Urban Health Mission (NUHM).¹² In Tamil Nadu, there are 400 Urban Primary Health centres in 84 cities and towns including Chennai corporation. Each UPHC will be served by Urban Health Nurse for a sector of 10,000 population. In addition, basic lab services and pharmacy services are available in the PHC. Unlike their rural counterpart there is no concept of subcenter in urban area as that of the rural PHCs and all UHN operate from their PHCs.

The provision of health services like immunization to vaccine preventable diseases, improving anemic status of AN mothers, early screening of newborn and children by school health program, delivery of drugs and follow up for NCDs hypertension, diabetes are few key activities at the level of community by the field health workers of PHC. The successful service delivery to the public when it functions in tandem with needs voiced through elected representatives of local self-governments was witnessed during massive drive of covid vaccination. Urban areas are characterized with vector and air borne outbreaks more frequently than rural areas disrupting the Maternal Childcare and Non-Communicable Disease prevention services.

However, the importance of preventive services for NCD and MCH are not adequately sensitized to local body administrators as that of water and sanitation. Hence, in the current context there is a need to strengthen the primary care service delivery of Maternal and Child Health and Non-Communicable Disease intervention components of the urban health system by focusing on convergence of Public Health cadre and the urban local bodies and strengthening it with adequate human resources and financial aid.

Problem Statement

The National Family health survey 2, 3 and 4 states that the key health indicators are poor in urban poor when compared to urban non poor, overall urban, and rural.³ Tamil Nadu with more than half of its population in Urban needs improved service delivery in Urban area with focus on Urban poor.

SWOT Analysis of Urban Health in Tamil Nadu Strength :

- Coexistence of Urban Local body with Public Health department under single umbrella with huge resources in terms of manpower, and resources.

- Statutory powers of officials flowing from both Tamil Nadu Municipalities act and the Tamil Nadu Public Health Act 1939.
- Supervision of essential services like water supply, sewerage, sanitation under single authority which play a pivotal role in Communicable diseases control
- Vibrant elected representatives that will bring the health needs to immediate attention
- Higher literacy rate than rural counterparts
- Better availability of support from NGOs and CSR activities in urban areas towards social sectors especially health.
- Health expenditure incurred by urban local bodies either from local funds or various Government of India funds especially mandatory devolution to Urban local bodies by Central Finance Commission.

Weakness :

- The civil infrastructure for the UPHCs is the weakest link. 25% of urban PHCs in TN doesn't have own building whereas it is 2% in rural areas.
- The Urban public health workforce are supposed to cater twice the population than rural counterparts as per Indian Population Health Standards which is which need to be relooked. Even the proportion of vacancies are higher in urban public health cadre than the rural areas.(13)
- Less importance to primary care services compared to secondary and tertiary care services. This is primarily due to the availability of huge government medical college hospitals, Headquarters hospitals more private health institutions in cities that focuses only in the secondary and tertiary care services with weak linkage to preventive care. The health in urban areas becomes synonymous with services of bigger institutions.
- The governance structure of Urban Health system itself more chaotic with multiple boundaries for multiple service providers. Within local bodies the water supply, sanitation, public health services under different wings have overlapping geographical boundaries with different authorities and coordination is more difficult.
- Non-separation of roles and responsibilities in preventive health and sanitation in the mandate of local bodies. Public health is specifically pointed towards Communicable diseases control like water and vector borne diseases and the emerging public health problems like NCDs, Mental health disorders needs to get sensitized in their minds.
- The equivalent of Male Health Worker in urban is Sanitary Inspector who is more preoccupied with conservancy management and has limited knowledge on emerging non

communicable diseases

Opportunities :

- Constitutional mandate of every local body to take care of their community public health.
- Decreased incidence of Water Borne diseases due to improved water supply and sanitation facilities so that the focus could be shifted to the other emerging public health challenges
- Easy accessibility of secondary and tertiary care institutions
- Choice and availability of Human Resources for Health of all Medical and Paramedical staff

Threats :

- High burden due to nature of rapid spread of any air borne and vector borne communicable diseases in urban setup
- Risk factors and disease conditions due to Pollutions, plastic, and biohazards
- Increased incidence and prevalence of Non-Communicable Diseases compared to rural areas.

Recommendations with respect to Urban Primary Health System in Tamil Nadu :

The evolution of NUHM framework and the implementation of their recommendations have started transforming the availability of health human resources and the infrastructure in urban areas. The polyclinic services of specialists in select centres with quality are attracting more people to urban PHCs. However, many issues remain to be unresolved in infrastructure, human resources, and governance. The recommendations are taken from the field level officers, administrators and from the recommendations of NUHM to Government for revamping urban health delivery system.

1. Leadership / Governance

- a. Supervisory cadre at UPHC levels: Sector Health Nurse and health Inspector for all UPHCs should be sanctioned and posted for supervision
- b. Zonal level Public Health Unit: Every 2.5 lakh population should have a public health Unit comprising Zonal Medical Officer, Community Health Nurse, and equivalent Zonal Health Supervisor.
- c. Corporation level supervisory officers: Corporations with more than 10 lakhs population may be sanctioned with a technical cadre like Maternal and Child Health Officer (MCHO) / Assistant Program Manager / Corporation Training Team Medical Officers. In the corporations and

municipalities with less than 5 lakhs population, second level officers in the district may be instructed to concentrate on the supportive supervision aspect of urban local bodies.

d. Revision of Job responsibilities of City Health Officer / Municipal Health Officer: As per G.O.Ms.No.241 Municipal Administration and Water Supply Department dated 01/10/1996, responsibilities of conservancy and Solid Waste Management are vested with the Engineering section of the Corporation. The City Health Officer is required to provide technical assistance only. But in all corporations, conservancy management is still monitored and supervised by the CHO / Health section. In the current context of competing public health priorities in the MCH & NCD domains this responsibility should be divested from Public Health wing, in the Municipal corporations. City Health Officers & Multi- Purpose Health Workers – Male category i.e., Sanitary Inspectors and Sanitary Officers should exclusively look after public health work related to disease control. The conservancy management should be taken out from the purview of Sanitary inspectors and Sanitary Officers.

e. Government Level: A high level committee with officers from Municipal administration department and Health department should be constituted and meet periodically to monitor and sort out the policy level issues in Governance, service delivery and resource management.

2. Service Delivery

a. All Sectors should be distinctively mapped to street level households. A head count survey like rural areas with updated family folders should be made out for planning of service delivery in all programs.

b. Every sector should have an own building of Wellness centres, preferably near the slum areas for stationing of Urban Health Nurse and Health inspector for service delivery.

c. The service area of the sector should be aligned with the ward boundaries of the town / cities so that the interests of the people representatives and health needs of the community can be converged.

d. UPHC timings: With majority of the population residing in the urban areas belonging to the working class, the availability of Medical Officers may be extended in the evening and morning. The erstwhile 'Urban Dispensary' kind of setup with OP functioning with a Medical Officer from 5 PM to 8 PM and 7 AM to 11 AM may be institutionalized.

e. Specialist availability: Urban health topography in Tamil Nadu is full of private specialists. A welfare state producing an appreciable number of Post Graduate doctors every year can position specialists in the field of Obstetrics, Anesthesia

and Pediatrics at least in Community Health Centers. In an alternative way, with majority district headquarters with Medical College hospitals, II year or final year Postgraduates can be posted in CHCs for provision of specialist services.

f. Integrated Health and Wellness approach: Many urban local bodies have dispensaries in siddha, homeopathy, yoga, and naturopathy at various locations. Hence, one CHC with adequate space may be identified may be redesignated as 'Integrated Health and Wellness Center' to cater the demands of people in primary care.

g. Special areas like gated communities, apartments: Maternal and Child health service delivery including immunization to be carried out in specific areas like apartments, gated communities and multi storied residential buildings are difficult. Certain specific clauses with respect to MCH & NCD may be added in the Tamil Nadu Public Health Act, 1939 to enable service delivery.

3. Health Workforce

a. Additional Medical Officer in UPHC: Two Medical Officers should be posted in all the Urban PHCs. In Community Health Centers five Medical Officers should be posted, preferably with Obstetrician, anesthetist, and pediatrician. Multi-Purpose Health Worker – Male: As per Indian Public Health standards, Male MPHWS in the cadre of Sanitary Inspector / Health Inspector to be posted.

b. Paramedical Staff: The gap analysis should be done periodically, and the vacancies must be filled up. Existing vacancies created due to retirement / death / promotion of local body appointed Urban Health Nurses to be filled at the earliest. Vacancies existing in certain categories like Lab Technicians, Pharmacists should be addressed.

c. Entomologist: Junior Entomologist cadre in corporations below 5 lakhs population and Senior Entomologist cadre in corporations above 5 lakhs population should be appointed to tackle the perennial burden of communicable diseases, specifically vector borne diseases.

d. Microbiologist: The city public health lab with microbiologist may be posted in all corporations with 5 lakhs plus and one senior microbiologist may be posted in all corporations with 10 lakhs plus population.

CONCLUSION

Strengthening of public health cadre as per Indian Public Health Standards, creating and strengthening wellness center in every sector, streamlining the governance structure from PHC to Government level and focused community driven approach are the few critical areas that must be addressed

in short and medium term to overcome the public health challenges in the urban areas.

REFERENCES

1. World Bank. Proportion of Urban Population India [Internet]. [cited 2022 Nov 28]. Available from: <https://data.worldbank.org/indicator/SP.URB.TOTL.IN.ZS?locations=IN>
2. State Planning Commission. 12th Five Year Plan Tamil Nadu - Urbanisation [Internet]. 2012 [cited 2022 Nov 21]. Available from: https://www.spc.tn.gov.in/fiveyearplans/12plan_e.htm
3. Urban Poor Urban Non Poor Overall Urban Overall Rural All-India Urban Poor NFHS-2 [Internet]. 2015 [cited 2022 Nov 21]. Available from: <http://uhrc.in/downloads/Factsheet-India.pdf>
4. Rural health Statistics 20 21. [cited 2022 Nov 28]; Available from: <https://hmis.nhp.gov.in/downloadfile?filepath=publications/Rural-Health-Statistics/RHS%202020-21.pdf>
5. Mishra A. RSSPAPPEBA and SP. Health Care Equity in Urban India. 2021.
6. Ganesan P, Nambiar D, Sundararaman T. Who's in charge of social determinants of health? Understanding the office of the municipal health officer in Urban areas. In: *The Social Determinants of Health in India: Concepts, Processes, and Indicators*. Springer Singapore; 2017. p. 103–15.
7. Forouzanfar MH, Alexander L, Bachman VF, Biryukov S, Brauer M, Casey D, et al. Global, regional, and national comparative risk assessment of 79 behavioural, environmental and occupational, and metabolic risks or clusters of risks in 188 countries, 1990-2013: A systematic analysis for the Global Burden of Disease Study 2013. *The Lancet*. 2015 Dec 5;386(10010):2287–323.
8. Murarkar S, Gothankar J, Doke P, Pore P, Lalwani S, Dhumale G, et al. Prevalence and determinants of undernutrition among under-five children residing in urban slums and rural area, Maharashtra, India: a community-based cross-sectional study. *BMC Public Health*. 2020 Dec 1;20(1).
9. Crocker-Buque T, Mindra G, Duncan R, Mounier-Jack S. Immunization, urbanization and slums - A systematic review of factors and interventions. *BMC Public Health*. 2017 Jun 8;17(1).
10. Fink G, Günther I, Hill K. Slum Residence and Child Health in Developing Countries. *Demography*. 2014;51(4):1175–97.
11. Pörtner CC, Su Y hsuan. Differences in Child Health Across Rural, Urban, and Slum Areas: Evidence From India. *Demography* [Internet]. 2018 Feb 1 [cited 2022 Nov 28];55(1):223–47. Available from: <https://pubmed.ncbi.nlm.nih.gov/29192387/>
12. B Report and Recommendations Of Technical Resource Group For National Urban Health Mission Final Report [Internet]. 2014 [cited 2022 Nov 21]. Available from: <https://nhsrcindia.org/sites/default/files/2021-03/Report%20Recommendations%20of%20TRG%20for%20NUHM.pdf>
13. Human Resources for Health in District Public Health Systems of India: State-wise Report 2020 [Internet]. 2020 [cited 2022 Nov 21]. Available from: https://nhsrcindia.org/sites/default/files/2021-06/All%20State%20Infographic__INNER_0.pdf

REVIEW ARTICLE - PUBLIC HEALTH

A STUDY ON CAREGIVER BURDEN AND THEIR COPING STYLES AMONG PRIMARY CAREGIVERS OF CANCER PATIENTS ON CHEMO/RADIOTHERAPY: A CROSS SECTIONAL ANALYTICAL STUDY FROM A TERTIARY CARE HOSPITAL IN VISAKHAPATNAM

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Abstract

BACKGROUND: Care services for cancer mainly focus on palliative care, where family members serve as informal caregivers. Caregivers are impacted by the care they offer, resulting in a burden. Higher levels of burden may be associated with increased morbidity and mortality among caregivers. There are several coping methods that may be used by people to get through their burdens. The purpose of this study is to estimate the primary caregiver burden and determine the factors associated with that burden. In addition, the primary caregivers' coping mechanisms were assessed.

METHODS: This study was a hospital-based cross-sectional analytical study done among 100 primary caregivers of cancer patients admitted to both the radiotherapy and oncology departments of a tertiary care hospital. Data was collected using the Zarit caregiver burden assessment scale and the Brief COPE scale questionnaire.

RESULTS: 43% of the caregivers had a mild to moderate burden. The caregiver adopted a problem-oriented coping style. Male caregivers relied on denial, whereas female caregivers relied on religion.

CONCLUSION: By measuring their burden and coping mechanisms, interventions may assist people in managing their physical, emotional, and social demands.

KEYWORDS: Cancer, Caregiver burden, chemo radiotherapy, coping mechanism.

INTRODUCTION

According to GLOBOCAN 2020, developing countries will account for the majority of the increase in global cancer incidence during the next 50 years.^{1,2,3}

Cancer care services for patients were limited in India and other low- and middle-income countries, which mainly focused on palliative care for advanced cancer patients, which pushed family members to serve as informal caregivers. A caregiver is defined as "someone who regularly helps and provides care for a person who is disabled or ill with tasks like dressing, shopping, or household tasks, or who offers other sorts of practical or emotional support".⁴ Informal caregivers are vulnerable to difficult circumstances and a lack of rapid problem-solving abilities, which can lead to improper emotional adjustment, resulting in caregiver burden or stress.^{4,5} Caregiver burden has been described by Zarit et al.⁶ as "a state resulting from necessary caring tasks or restrictions that cause discomfort for the caregiver". According to a US report on caregiving, 58% of caregivers were in their productive age group, and the main problem they perceived was mental and emotional illness.⁷ Furthermore, higher levels of burden may be associated with increasing morbidity and mortality among caregivers.⁸ One should be equally concerned about the physical and

emotional well-being of the caregivers as well.

There are several coping methods that may be used by people to get through their burdens or stressful situations. Coping is defined by Folkman and Lazarus⁹ as the "cognitive and behavioral efforts that are implemented to solve problems and reduce the stress that these problems may cause." The type of a person's coping mechanisms can have a direct influence not only on their own quality of life but also on the patient's quality of life. The various coping strategies are classified as problem-focused, emotion-focused, and avoidance-focused. A problem-focused coping strategy indicates that efforts are being made to solve problems in a practical manner. A coping strategy that is emotion-focused aims to control the feelings brought on by the stressful circumstance. Avoidant coping involves making physical or mental efforts to disconnect from the stressor.¹⁰

Studies have been done separately on the stress of



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caregiving, caregivers' quality of life, and coping strategies. There has been relatively limited study on the combination of caregiver load and coping techniques. This study aims to estimate the primary caregiver burden and identify the factors associated with that burden. In addition, the primary caregivers' coping strategies were assessed. This will assist them in enhancing their patient-care strategies and coping mechanisms, as well as in meeting the physical, financial, and emotional needs of the caregiver.

METHODOLOGY

This hospital-based cross-sectional analytical study included 100 primary caregivers of cancer patients admitted in both radiotherapy and oncology departments at a tertiary care hospital in Visakhapatnam, Andhra Pradesh. The inclusion criteria were as follows: primary caregivers of cancer patients admitted for chemo or radiation who offer the majority of care on a daily basis; 18 years old or older; taking care of the patients for at least 3 months; able to speak vocally. The following were the exclusion criteria: caregivers with no history of any psychiatric disease and who were paid to care for the patients. We achieved a sample size of 84 with 10% non-response using the formula $4pq/l2$, where p is 70% (in Mishra et al. study,⁸ and the relative error was 14%. The final sample size was 97, rounded off to 100.

As a result, the study included caregivers who met the inclusion criteria and were willing to take part from August to October 2022. Ethics approval was obtained from the institutional ethics committee, and written informed consent was taken. The questionnaires were filled out by the researcher using the interview method.

STUDY TOOLS

The social demographic details of the patient and their primary caregivers were collected. The socioeconomic status of the caregivers was classified using the Modified Kuppusamy socioeconomic scale for 2022. The Zarit Burden Interview (ZBI), a validated, short 12-item version^{11,12} was used to assess caregiver burden. The caregiver's coping mechanism was measured using the modified 28-item Brief COPE scale.¹³

Statistical analyses :

All statistical analyses were performed using IBM SPSS Statistics 21. Descriptive data were expressed in proportion or mean and SD. The normality of the data was tested and a parametric test was applied. Multivariate linear stepwise regression analysis was done to determine the predictors of caregiver burden. Pearson correlation was used to analyze the

relationship between the components of coping and burden.

RESULTS

DEMOGRAPHIC DETAILS:

The demographic information for the patients and the caregivers is shown in Table 1. The mean (SD) age of patients was 49.85 (12.5) years (19 to 76 years), and the mean duration of the illness was 20 months. In terms of caretakers, their mean (SD) age was 41 (16) years. The majority of caregivers (88%) said that their patients were cooperative with their caretakers or doctors.

FACTORS ASSOCIATED WITH THE BURDEN OF CAREGIVING:

In this study, the mean ZBI score was 15.7 (7.3) (min 5; max 33). This study revealed that 43% had a mild to moderate burden, 30% had a no to mild burden and 27% had a high burden.

The analysis of the burden score with patient and caregiver characteristics is shown in Tables 2 and 3.

DETERMINANTS OF THE BURDEN OF CAREGIVING:

A stepwise multiple regression analysis was done to determine the predictors of the burden of caregiving. The variables that showed significance in univariate analysis were taken for regression. The residuals were normally distributed, and the linearity was assessed. There was independence of residuals as assessed by the Durbin-Watson statistic of 2.03. There was evidence of homoscedasticity but no evidence of multicollinearity. The values were found to be within acceptable limits for studentized deleted residuals, Cooks distance, and leverage values.

The burden on caregivers was found to be higher in this study for caregivers who were working and caregivers of patients who were illiterate and had completed a primary level of education ($R^2 = .162$, adj $R^2 = .144$, $p = .001$), which accounted for 16% of the total variations (Table 4).

COPING SCALE:

The mean coping score was 56.7 (7.1), which ranges from 40 to 72. The mean score for males was 56.3 (7.5), and for females, it was 57.1.⁷ Problem-solving styles were preferred by caregivers over avoidant styles (Table 5).

Religion, acceptance, informational support, and emotional support were among the coping techniques used by respondents, according to our findings. Humor, self-blame, substance use, and denial were almost never employed by the caregivers (Fig 1-3).

Men were more likely to use denial strategies ($p = 0.019$), whereas women used religion strategies ($p = 0.026$) (Table 6).

Caregivers in their early adulthood used denial strategies more than those in their middle adulthood ($p = 0.021$).

Unmarried caregivers were more likely to engage in self-distraction style (p 0.042). Working caregivers considerably adopted the denial strategy (p 0.001), whereas non-working caregivers largely utilized religion as a strategy (p 0.004). The behavioral disengagement method was more commonly used by caregivers with secondary education (p 0.023) and degrees (p 0.037) than by caregivers without education. Caregivers who cared for patients for 6 months to a year were more likely to use the self-distraction mechanism (p 0.023) than caregivers who cared for patients for less than 6 months. Lower-income caregivers were more likely to use a behavioral disengagement method (p 0.003).

Table 7 demonstrates the relationship between coping components and caregiver burden. The assumption of normality was found to be supported by the Q-Q plot prior to computing the correlations. A visual inspection of the box plot revealed outliers in some subscales, which were taken for analysis. Among the coping strategies, self-distraction, active coping, and venting were significantly positively correlated with burden, while religion was negatively correlated.

DISCUSSION

In this study, 41% of care providers were between the ages of 35 and 64, and 50% of them were female. The majority of caretakers were married, employed, and uneducated. The majority of the patients were cared for by their children or parents, who were then followed by their spouses, and the majority of them are upper middle-class. Only 17 percent of the patients were working, and almost two-thirds were married, which was comparable with the study by Mishra et al.⁸ and the Bekdemir study.¹⁴

Both Mishra⁸ and our study discovered that a high majority of individuals had a mild to moderate burden. This might be due to the way Indian families are living. The caregiver's social support system is a key measure of their improved physical and emotional well-being. According to the literature, family support decreases caregiver burden and improves quality of life for caregivers who care for patients with chronic conditions.¹⁴

The mean ZBI score in our survey was 15.7 (7.3), with 27% experiencing high burden. In the Lukhmana et al. study⁶, 43.5% of participants reported a moderate-to-severe burden, which contrasts with our findings. In the Mirsoleymani et al. study¹⁵, a higher proportion (48.1%) of caregivers indicated a high burden when the caregiver burden assessment questionnaire was used. The mean score was higher in the Mishra⁸ and Harding et al.¹⁶ studies because the study participants were from intensive care or high dependency

units.

According to our findings, the spouse faces a greater burden than in other relationships, which is consistent with the Zuo et al. study.¹⁷ This may be due to the fact that they are emotionally attached to their life partner, and the whole responsibility gets shifted to their partner.

Furthermore, the burden of care in our study was much higher for caregivers who were working. This may be due to the fact that employees must adjust to their shift patterns, take extra time off for frequent hospital visits and hospitalizations, and complete their tasks. In contrast to our findings, unemployed caregivers in the Bekdemir study.¹⁴ had a larger burden.

Additionally, caregivers who provided care for between one and five years had a greater strain than those who provided care for less than six months. Studies by Bekdemir,¹⁴ Chiou et al.¹⁸ and Zuo¹⁷ show that providing care for a person over a longer period of time causes a greater burden.

When care was provided for 5 to 10 years, the mean burden score was lower. Caregivers who offer care for longer periods of time, according to Huang et al.¹⁹ may experience less stress and anxiety because they have more time to customize their caregiving work to their priorities. The burden and its psychological impact might vary based on disease stage, caregivers' social assistance, and disease duration.

The burden was not significantly associated with the caregiver's age group, gender, marital status, degree of education, or socioeconomic situation. This is also true in Mishra⁸ and Bekdemir¹⁴ studies. Furthermore, male caregivers, caregivers with higher levels of education, and married caregivers had a larger burden, which was similar to the Zuo study.¹⁷ When the wife becomes ill, the husband is suddenly burdened with increased care responsibilities. The circumstances exacerbate his emotional, financial, and time constraints significantly. Other researchers, including Orak²⁰ and Sanuade²¹, have discovered no significant relationship between gender and caregiver burden, which is consistent with our findings.

In our study and the study by Chiou et al.¹⁸, it was shown that caregivers with lower socioeconomic status have higher levels of caregiver burden because they may face out-of-pocket costs, such as travel expenses for illness treatment.

Caregivers of patients who were illiterate or had just completed primary school and caregivers of married patients had a significantly higher burden. This was in contrast to our findings in the Bekdemir study¹⁴ in which caregivers of patients with higher education had a higher mean score. Patients with lower levels of education are more likely to

rely on their caretakers for treatment management, which increases the burden on caregivers.

In the regression analysis, the caregiver's working status and the patient's education level were significant, explaining 16% of the total variance. One of the determinants of caregiver burden in the Bekdemir research¹⁴ was caregiver working status.

Problem-solving strategies were preferred by caregivers, while in the Kamarulbahri¹⁰ and Kasi et al.²² and Suriyamoorthi²³ studies, emotion-focused coping was preferred. According to Fortune et al.²⁴, and Ong et al.²⁵ studies, a problem-focused approach was found to lessen caregivers' psychological distress in general.

According to our findings, respondents utilized positive/effective coping tactics such as religion, acceptance, informational support, and emotional support, whereas negative/ineffective coping approaches such as humor, self-blame, drug use, and denial were practically never used. The research conducted by Ong et al.²⁵ had similar results. The results of the current study support those of the Antony study²⁶ and the Mukwato study²⁷, which found that the caregivers mostly used religion and informational support. Furthermore, Kamarulbahri¹⁰ and other researchers²⁸ found that religion and acceptance were the most common coping techniques, whereas substance use was the least common. Religion is usually regarded as the most common coping method used by caregivers. It is thought to be an efficient coping mechanism, independent of religious belief.²⁹ In other words, spiritual belief enhances health and provides hope.¹⁰ As a result, it has been found that patients who use religion as a coping mechanism are better able to manage and overcome more difficult life situations.²⁹

Men mostly employed denial (avoidant), while women primarily utilized religion (emotionally focused), which was consistent with the Suriyamoorthi study.²³ The only characteristic significantly associated with an emotion-focused coping strategy in the Kamarulbahri research¹⁰ was gender.

In contrast to the Suriyamoorthi research²³, caregivers who were working were significantly more likely to use the denial mechanism. One characteristic that was consistent throughout both studies was that lower-income caregivers used more negative coping mechanisms.

In our study, religion had an inverse relationship with burden (ie, more religious caregivers had less burden), whereas caregivers who adopted self-distraction, active coping, and venting had a positive relationship (ie, a high burden). One component of the maladaptive (emotionally

oriented) coping method was venting, which explained 4% of the variance in the rise in burden score in our study and Ong et al. study.²⁵ According to the findings of the study by Kausar and Powell³⁰, caregivers who used emotion-focused coping methods had more difficulties, resulting in poor adaptation, than those who used problem-focused coping strategies, which provided better results.

Substance use as a coping strategy, on the other hand, was rarely used in our study. This might be due to secrecy or a reluctance to accept the usage. According to a Ministry of Social Justice and Empowerment report³¹, a significant percentage of individuals in India use psychoactive substances, and substance use affects all demographic groups. The long-term effects of substance abuse, such as drinking too much or using other drugs can be stressful and harmful to the caregiver's health.

Table 1: Sociodemographic Details of Patients and their Caregivers

S.No	VARIABLE	PATIENT		CAREGIVER	
		Frequency (n)	%	Frequency (n)	%
1	AGE:				
	Early adulthood	11	11	46	46
	Middle adulthood	74	74	41	41
	Late adulthood	15	15	13	13
2	GENDER				
	Male	38	38	50	50
	Female	62	62	50	50
3	MARITAL STATUS				
	Married	95	95	78	78
	Unmarried	5	5	22	22
4	EDUCATION STATUS				
	Illiterate	47	47	29	29
	Primary	18	18	6	6
	Middle	16	16	14	14
	High	7	7	24	24
	Intermediate/ diploma	4	4	9	9
	Degree	8	8	18	18
5	WORKING STATUS				
	Working	17	17	69	69
	Not working	83	83	31	31
6	DURATION OF CARE GIVING				
	< 6 months			46	46
	6 months – 1 year			23	23
	1-5 years			26	26
	5-10 years			5	5
7	RELATIONSHIP WITH THE PATIENT				
	Spouse			34	34
	Parent/ Child			47	47
	Others			19	19
8	SOCIOECONOMIC STATUS				
	Upper middle			10	10
	Lower middle			19	19
	Upper lower			63	63
	Lower			8	8

Table 2: Analysis of The ZBI Scores In Relation to the Caregiver Variables

VARIABLE OF THE CAREGIVER	ZARIT BURDEN INTERVIEW SCORE				
	M	SD	F/t (df)	p value	Post Hoc test
AGE:					
Early adulthood	15.7	7.02	0.195 (2,97)	0.824	
Middle adulthood	15.3	7.42			
Late adulthood	16.7	8.04			
GENDER					
Male	16.7	7.54	1.369 (98)	0.174	
Female	14.7	6.90			
MARITAL STATUS					
Married	15.8	7.45	0.403 (98)	0.688	
Unmarried	15.1	6.67			
EDUCATION STATUS					
Illiterate	16.2	7.55	1.989* (5,28)	0.112	
Primary	15.7	9.20			
Middle	12.0	3.80			
High	17.3	8.97			
Intermediate/ diploma	16.6	7.86			
Degree	15.1	4.82			
WORKING STATUS					
Working	17.4	7.55	4.310 (86) ^s	0.000*	
Not working	11.9	4.87			
DURATION OF CARE GIVING					
< 6 months (1)	14.2	6.26	3.626 (3,96)	0.016*	3 > 1 [@]
6 months – 1 year (2)	15.8	7.32			
1-5 years (3)	19.11	7.85			
5-10 years (4)	10.6	7.16			
RELATIONSHIP WITH THE PATIENT					
Spouse (1)	18.12	7.58	3.577 (2,97)	0.032*	1 > 3 [@]
Parent/ Child (2)	15.02	7.27			
Others (3)	13.0	5.47			
SOCIOECONOMIC STATUS					
Upper middle	13.4	6.42	0.909 (3,96)	0.440	
Lower middle	16.3	8.30			
Upper lower	15.4	6.88			
Lower	18.9	8.74			

welch value.

* statistically significant.

\$- equal variance not assumed in t test

@- Tukeys post hoc analysis.

Table 3: Analysis Of The ZBI Scores in Relation to the Patient Variables

VARIABLE OF THE PATIENT	ZARIT BURDEN INTERVIEW SCORE				
	M	SD	F/t (df)	p value	Post Hoc test
AGE:					
Early adulthood (1)	11.9	4.37	3.7 (2,25)#	0.039*	2 > 1 ^{&}
Middle adulthood (2)	16.2	7.58			
Late adulthood (3)	15.8	6.83			
GENDER					
Male	14.8	6.33	-1.049 (90)\$	0.297	
Female	16.3	7.77			
MARITAL STATUS					
Married	15.88	7.40	2.576 (7)\$	0.036*	
Unmarried	12.0	2.91			
EDUCATION STATUS					
Illiterate (1)	16.7	7.2	6.331 (5,23)#	0.001*	1,2 > 5 ^{&}
Primary (2)	17.7	7.14			
Middle (3)	14.3	6.7			
High (4)	13.0	9.5			
Intermediate/ diploma (5)	10.0	1.7			
Degree (6)	14.0	4.06			
WORKING STATUS					
Working	16.8	7.69	0.704 (98)	0.489	
Not working	15.5	7.20			

welch value.

* statistically significant.

\$- equal variance not assumed in t test

@- Tukeys post hoc analysis.

& Games-howell

Table 4: Predicting Caregiver Burden using Multiple Regression Analysis

VARIABLE	ZBI score			
	B	95% CI	t	p
Constant	24.715	20.3-29.1	11.233	0.000
Caregiver working status	-5.284	-8.17 to -2.34	-3.632	0.000
Patient education level	-0.926	-1.78 to -0.078	-2.167	0.033

Note: R2 = .162, adj R2= 0.144, p < .001, F(2,97) = 9.36

Table 5: The Mean and SD of Primary Coping Styles

PRIMARY COPING STYLES	MEAN (max score 4)	SD
Problem- focused	2.28	0.45
Emotion- focused	2.15	0.27
Avoidant coping	1.63	0.37

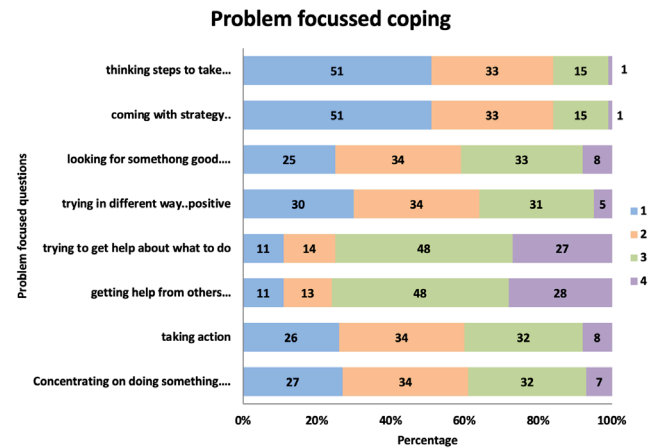


Figure 1: Problem Focused Coping Adopted by Caregivers of Cancer Patients

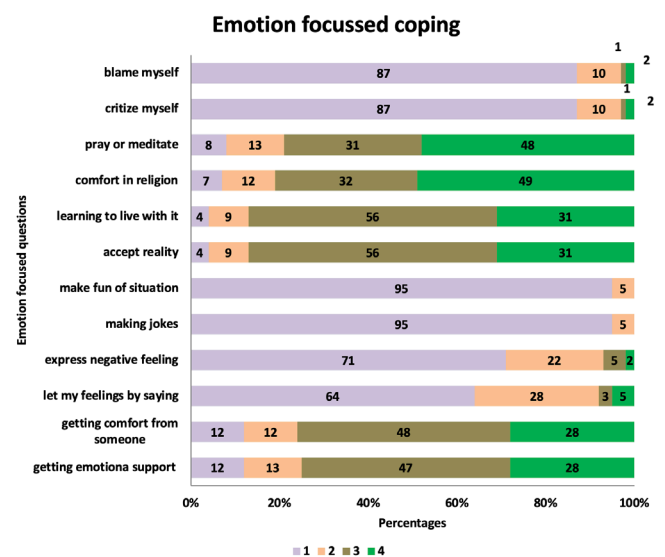


Figure 2: Emotion Focused Coping Adopted by Caregivers of Cancer Patients.

Figure 3 : Avoidant Focused Coping Adopted by Caregivers of Cancer Patients.

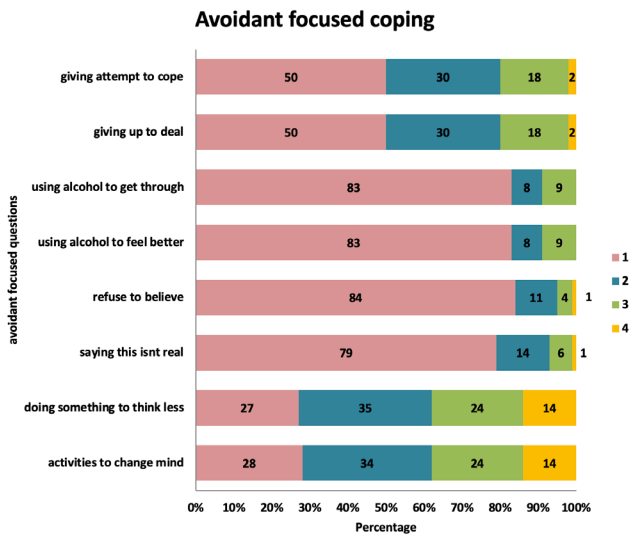


Table 6 : Comparison of the mean and SD of the Brief Cope Components by Gender

COMPONENTS	MEAN (SD)		t (df)	P VALUE
	MALE	FEMALE		
Self-distraction	2.26 (1.1)	2.15 (0.9)	0.542(98)	0.589
Active coping	2.28 (0.9)	2.13 (0.85)	0.833(998)	0.407
Denial	1.41(0.6)	1.19 (0.3)	2.388(92)#	0.019
Substance use	1.36(0.7)	1.20(0.4)	1.458(81)#	0.149
Emotional support	2.99 (0.8)	2.66(0.9)	1.88 (98)	0.06
Informational support	3.0(0.8)	2.8 (0.83)	1.137(98)	0.258
Behavioral disengagement	1.8(0.7)	1.72(0.8)	0.487(98)	0.627
Venting	1.47(0.5)	1.53(0.6)	- 0.548(98)	0.58
Positive reframing	2.26 (0.7)	2.12(0.7)	0.892(98)	0.375
Planning	1.92 (0.7)	1.72 (0.8)	1.303(98)	0.196
Humor	1.10 (0.2)	1.04(0.19)	1.172(98)	0.244
Acceptance	3.22(0.7)	3.14(0.7)	0.546(98)	0.586
Religion	3.0 (0.8)	3.36(0.78)	- 2.263(98)	0.026
Self-blame	1.12(0.3)	1.24(0.6)	- 1.115(98)	0.268

#- welch value.

Table 7: Caregiver Burden's Relationship with Brief Cope Subscale

COMPONENTS	CAREGIVER BURDEN (r)	p VALUE
Self-distraction	0.217	0.030*
Active coping	0.225	0.025*
Denial	0.1	0.324
Substance use	-0.043	0.668
Emotional support	-0.083	0.41
Informational support	-0.037	0.714
Behavioral disengagement	0.088	0.386
Venting	0.205	0.04*
Positive reframing	-0.084	0.408
Planning	0.057	0.574
Humor	-0.117	0.246
Acceptance	-0.109	0.283
Religion	-0.213	0.033*
Self-blame	0.017	0.867

* Statistically significant $p < 0.005$

DISCUSSION

This was a cross-sectional study of caregivers of cancer patients receiving chemotherapy and radiotherapy in hospital wards. Data on the kind of cancer, its stage, the patients' socioeconomic situation, and the number of hours per day spent caring for the patients were not collected.

CONCLUSION

This study suggests that by providing caregivers with community intervention, they can improve their adaptive coping capacities, especially through problem-oriented strategies combined with social support to minimize their burden. More research on the influence of caregiver burden on health is recommended.

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REFERENCES

- Deo SVS, Sharma J, Kumar S. GLOBOCAN 2020 Report on Global Cancer Burden: Challenges and Opportunities for Surgical Oncologists. Ann Surg Oncol. 2022 Oct 1;29(11):6497–500.
- 39-All-cancers-fact-sheet.pdf [Internet]. [cited 2022 Oct 17]. Available from: <https://gco.iarc.fr/today/data/factsheets/cancers/39-All-cancers-fact-sheet.pdf>
- 356-india-fact-sheets.pdf [Internet]. [cited 2022 Oct 17]. Available from: <https://gco.iarc.fr/today/data/factsheets/populations/356-india-fact-sheets.pdf>
- Mourad GM, Zaki RA, Ali RA. Improving Coping Abilities among Caregivers of Patients with Cerebrovascular Stroke. Journal of Education and Practice. 2014;14.
- Kondeti AK, Yadala A, Lakshmi NR, Prakash CSK, Palat G, Varthya SB. Assessment of Caregiving Burden of Family Caregivers of Advanced Cancer Patients and Their Satisfaction with the Dedicated Inpatient Palliative Care Provided to Their Patients: A Cross-Sectional Study from a

Tertiary Care Centre in South Asia. *Asian Pac J Cancer Prev*. 2021 Jul;22(7):2109–15.

6. Lukhmana S, Bhasin S, Chhabra P, Bhatia M. Family caregivers' burden: A hospital based study in 2010 among cancer patients from Delhi. *Indian J Cancer*. 2015;52(1):146.

7. AARP1339_RR_Caregiving18to49_5081.pdf [Internet]. [cited 2022 Nov 18]. Available from: https://www.caregiving.org/wp-content/uploads/2021/05/AARP1339_RR_Caregiving18to49_5081.pdf

8. Mishra S, Gulia A, Satapathy S, Gogia A, Sharma A, Bhatnagar S. Caregiver Burden and Quality of Life among Family Caregivers of Cancer Patients on Chemotherapy: A Prospective Observational Study. *Indian J Palliat Care*. 2021;27(1):109–12.

9. Baumstarck K, Chinot O, Tabouret E, Farina P, Barrié M, Campello C, et al. Coping strategies and quality of life: a longitudinal study of high-grade glioma patient-caregiver dyads. *Health Qual Life Outcomes*. 2018 Aug 2;16:157.

10. Kamarulbahri TMST, Ariaratnam S, Nikmat AW, Abdullah NN, Khing TL. Coping strategies and their associated factors among caregivers of patients with schizophrenia in Kuantan, Malaysia. *Front Psychiatry*. 2022 Sep 29;13:1004034.

11. Novak M, Guest C. Application of a multidimensional caregiver burden inventory. *Gerontologist*. 1989 Dec;29(6):798–803.

12. Bédard M, Molloy DW, Squire L, Dubois S, Lever JA, O'Donnell M. The Zarit Burden Interview: a new short version and screening version. *Gerontologist*. 2001 Oct;41(5):652–7.

13. Coping Orientation to Problems Experienced Inventory (Brief-COPE) – NovoPsych [Internet]. [cited 2022 Nov 13]. Available from: <https://novopsych.com.au/assessments/formulation/brief-cope/>

14. BEKDEMİR A, İLHAN N. Predictors of Caregiver Burden in Caregivers of Bedridden Patients. *J Nurs Res*. 2019 Jun;27(3):e24.

15. Mirsoleymani SR, Rohani C, Matbouei M, Nasiri M, Vasli P. Predictors of caregiver burden in Iranian family caregivers of cancer patients. *J Educ Health Promot*. 2017 Oct 4;6:91.

16. Harding R, Gao W, Jackson D, Pearson C, Murray J, Higginson IJ. Comparative Analysis of Informal Caregiver Burden in Advanced Cancer, Dementia, and Acquired Brain Injury. *J Pain Symptom Manage*. 2015 Oct;50(4):445–52.

17. Zuo Y, Luo BR, Peng WT, Liu XR, He YL, Zhang JJ. Informal caregiver burden and influencing factors in gynaecological oncology patients hospitalized for chemotherapy: a cross-sectional study. *J Int Med Res*. 2020 Dec 1;48(11):0300060520974927.

18. Chiou CJ, Chang HY, Chen IP, Wang HH. Social support and caregiving circumstances as predictors of caregiver burden in Taiwan. *Archives of Gerontology and Geriatrics*. 2009 May 1;48(3):419–24.

19. Huang CY, Musil CM, Zauszniewski JA, Wykle ML. Effects of social support and coping of family caregivers of older adults with dementia in Taiwan. *Int J Aging Hum Dev*. 2006;63(1):1–25.

20. Orak O. Caregiver Burden in Family Members of Cancer Patients. *Journal of Psychiatric Nursing*. 2015 Jan 1;

21. Sanuade OA, Boatemaa S. Caregiver profiles and determinants of caregiving burden in Ghana. *Public Health*. 2015 Jul 1;129(7):941–7.

22. Kasi PM, Naqvi HA, Afghan AK, Khawar T, Khan FH, Khan UZ, et al. Coping Styles in Patients with Anxiety and Depression. *ISRN Psychiatry*. 2012 Jun 18;2012:128672.

23. M. S, N. P, J. R. A study on coping skills of caregivers of patients with bipolar disorder. *Int J Res Med Sci*. 2018 Oct 25;6(11):3647.

24. Fortune DG, Smith JV, Garvey K. Perceptions of psychosis, coping, appraisals, and psychological distress in the relatives of patients with schizophrenia: An exploration using self-regulation theory. *British Journal of Clinical Psychology*. 2005;44(3):319–31.

25. Ong HC, Ibrahim N, Wahab S. Psychological distress, perceived stigma, and coping among caregivers of patients with schizophrenia. *Psychol Res Behav Manag*. 2016 Aug 16;9:211–8.

26. Antony L, George LS, Jose TT. Stress, Coping, and

Lived Experiences among Caregivers of Cancer Patients on Palliative Care: A Mixed Method Research. Indian Journal of Palliative Care. 2018;24(3):7.

27. Mukwato KP, Mweemba P, Makukula MK, Makoleka MM. Stress and Coping Mechanisms Among Breast Cancer Patients and Family Caregivers: A Review of Literature. Medical Journal of Zambia. 2010;37(1):6.

28. Scazufca M, Kuipers E. Coping strategies in relatives of people with schizophrenia before and after psychiatric admission. Br J Psychiatry. 1999 Feb;174(2):154–8.

29. Yusoff N. Reliability and Validity of the Brief COPE

Scale (English Version) Among Women with Breast Cancer Undergoing Treatment of Adjuvant Chemotherapy: A Malaysian Study. 2010;65(1):4.

30. COPING AND PSYCHOLOGICAL DISTRESS IN CARERS OF PATIENTS WITH NEUROLOGICAL DISORDERS /TITLE> [Internet]. [cited 2022 Nov 21]. Available from: <https://www.dinf.ne.jp/doc/english/asia/resource/apdrj/z13jo0400/z13jo0407.html>

31. Survey Report636935330086452652.pdf [Internet]. [cited 2022 Nov 16]. Available from: <https://socialjustice.gov.in/writereaddata/UploadFile/Survey%20Report636935330086452652.pdf>

REVIEW ARTICLE - PUBLIC HEALTH

PREVALENCE OF AMBLYOPIA AMONG SCHOOL GOING CHILDREN IN FIELD PRACTICE AREA OF MODEL RURAL HEALTH RESEARCH UNIT (MRHRU), TIRUNELVELI

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Abstract

BACKGROUND : Amblyopia (lazy eye) is the second most common cause of functional low vision in children in developing countries. Amblyopia is an important health problem because it causes profound and lifelong visual impairment. The latest meta-analysis article established 99.2 million people with amblyopia in 2019 worldwide. Understanding the prevalence rate of amblyopia is important for adequate health care planning. This article aims to determine the prevalence of amblyopia and its distribution among school going children in Kallur PHC area.

METHODS : A cross sectional study was conducted in 3432 school going children in field practice area of MRHRU. Demographic data, visual acuity, and detailed ophthalmic examination including anterior segment and posterior segment examination were done.

RESULTS : Prevalence of amblyopia was close to 1 %, with the predominant cause of amblyopia was due to refractive errors, anisometric amblyopia was 89% and strabismic amblyopia 6% and mixed amblyopia was also in equal numbers.

CONCLUSION : The uncorrected refractive error for long time leads to amblyopia. The main complication of amblyopia is an irreversible, lifelong decrease in vision. Parents should be educated on the importance of early vision assessment for their children and the need for follow-up to prevent amblyopia. Screening and providing early treatment for the children with refractive error significantly reduces the load of amblyopia.

KEYWORDS : Amblyopia, refractive error, school children, blindness

INTRODUCTION

Amblyopia is a disorder in which a person experiences poor vision due to harmful visual experience at a very young age.¹ Amblyopia can be both unilateral or bilateral, in this condition there is absence of any obvious structural or pathologic anomalies but can occur due to any one of the following conditions strabismus, refractive errors, and anatomic obstruction in early childhood. Early screening of these factors and treating them has better outcomes.² due to availability of reports from various animal studies it is now understood that amblyopia represents functional and morphological effects of visual deprivation on the visual cortex and the lateral geniculate nucleus.³ The prevalence of amblyopia throughout the world was found to be 1.36% whereas the prevalence of amblyopia in Asia is 1.16%.⁴ The prevalence of amblyopia according to one study done in Central India is found to be 4.3% while another study done in South India claims a prevalence of 6.6%.^{5,6} Amblyopia is a leading cause of vision impairment in children and usually begins in infancy or childhood. Congenital cataract, congenital ptosis and corneal injury or corneal dystrophy can also cause amblyopia but are less common.² Amblyopia

is a public health problem and is relatively common. This is the first study done to determine the prevalence of amblyopia and identify the causes of amblyopia in Tirunelveli. Our desire is to contribute to the improvement of visual screening program that will ensure early detection, diagnosis and management of amblyopia in Tamil Nadu.

OBJECTIVE

Our objective was to estimate prevalence of amblyopia among school children in Kallur PHC area.

MATERIALS AND METHODS

Permission for conducting the study was obtained from Institutional Ethics Committee of Tirunelveli medical college and hospital.



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We conducted a cross sectional descriptive study involving 3432 children aged 5 to 19 years, studying in 35 schools in Kallur, MRHRU (Model Rural Health Research Unit) field practice area, Tirunelveli, established by the Department of Health Research, Government of India which is linked to the Tirunelveli Medical College. It is mentored by the ICMR – National Institute of Epidemiology, Chennai.

MRHRU field practise area has a population of 36,663 and is an area that falls under Papakudi and Mannur blocks in Tirunelveli district; comprising of 14 village clusters. There are 28 Primary Schools, 2 Middle Schools, 2 High Schools and 3 Higher Secondary School. The total number of schools going children in MRHRU field practise area is 3432. All the school going children between the age group of 5 to 19 years were screened by an Ophthalmologist along with an ophthalmology resident simultaneously, with the help of allied health workers including the Principal Investigator (PI). Permission was obtained from all the necessary authorities from District to block level. For children studying up to 8th grade Informed written consent and assent was obtained from parents and students respectively /guardians. For the rest of the children only written consent was obtained.

To diagnose the presence of amblyopia, which is the outcome variable, various examinations were done including Snellen's chart in both English and Tamil were used for estimation of distant visual acuity. In children of lower grades who were not able to read Snellen's letter chart, tumbling E chart was used. Retinoscopy and subjective correction were done for all children. Dilated fundus examination was done using Indirect Ophthalmoscope.

The data containing details of history and examination were tabulated and analysed using SPSS version 26. Descriptive measures like frequency and percentages were used to identify the distribution and prevalence of amblyopia.

OPERATIONAL DEFINITIONS

Unilateral amblyopia was defined as 2-lines interocular difference in VA with at least 6/12 or worse in the worse eye (with unilateral amblyogenic factors). Bilateral amblyopia was defined as VA 6/12 or less in both eyes (with bilateral amblyogenic factors).¹¹

Classification of amblyopia for each patient amblyopia was classified as strabismic, anisometropic, mixed and deprivation amblyopia. Anisometric amblyopia is defined as any amblyopia that occurs due to refractive cause with at least 1 dioptre between 2 eyes, Strabismic Amblyopia was defined as deviation of one eye with loss of eye parallelism, mixed amblyopia is a condition 2 or more causes of amblyopia co-

exist in the same person, Deprivation/stimulus deprivation amblyopia is where deprivation happens when eye diseases prevent the light stimulus from reaching the retina, thus forestalling the normal visual process.¹²

RESULTS

A total of 3432 children were screened between the ages of 5 and 19 years. Out of them 1659 (48.30%) were boys and the rest were girls. 1893 (55.15%), 1463 (43.62%) and 76 (2.21%) children were in the age groups of 5 to 9 years, 10 to 14 years, 15 to 19 years respectively. 53.61%, 28.05%, 17.01% and 1.31% of the students were studying in primary, middle, secondary and higher secondary schools respectively. Predominate number of the students were from nuclear families (75.40%), most of the fathers and mothers of these children were self-employed (32%) or farmers (25%) or labourers (17%). (Table 1)

Table 1 :Descriptive table containing socio demographic characteristics and ocular morbidity

CHARACTERISTICS		COUNT	PERCENTAGE
Education Category	Primary	1840	54%
	Secondary	963	28%
	High School	584	17%
	Higher Sec School	45	1%
Sex	Male	1659	48.30%
	Female	1773	51.70%
Age Category	5-9	1893	55%
	10-14	1463	43%
	15-19	76	2%
Family Type	Nuclear Family	2589	75.4%
	Joint Family	649	18.9%
	Single Parent	160	4.7%
	Guardian Custody	26	0.8%
	Others	8	0.2%
Father Occupation	Unemployed	326	9.5%
	Laborer	582	17.0%
	Self-employed	1124	32.8%
	Farmer	850	24.8%
	Clerical	182	5.3%
	Shop Keeper	167	4.9%
	Semi professional	16	0.5%
	Professional	11	0.3%
Mother Occupation	Unemployed	267	7.8%
	Laborer	615	17.9%
	Self-employed	1131	33.0%
	Farmer	879	25.6%
	Clerical	316	9.2%
	Shop Keeper	145	4.2%
	Semi professional	18	0.5%
	Professional	6	0.2%

Amblyopia

Out of the total students screened, 0.96 % of them had amblyopia (figure 1), anisometric type of amblyopia was found in 28 students (84.84%), Strabismus alone and mixed type of amblyopia was found in 1 (3.03%) and 2

(6.06%), While stimulus deprivation amblyopia was found in 2 (6.06%). (Table 1) bilateral amblyopia was found in 15 students (45.46%) while unilateral amblyopia was found in 18 (54.54%). (Table 2) (Table 3)

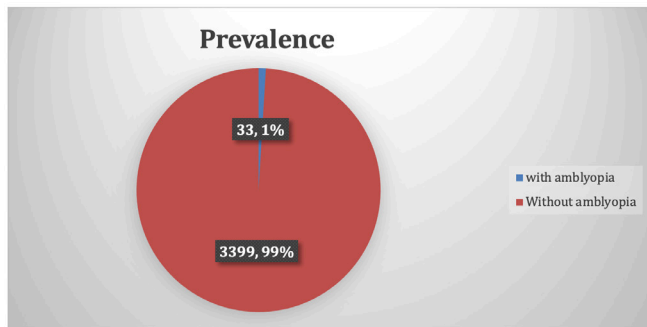


Figure 1: Prevalence of amblyopia

Table 2 : Classification of Amblyopia

CHARACTERISTICS	UNILATERAL	%	BILATERAL	%	TOTAL
Strabismic amblyopia	1	100	0	0	1
Anisometric amblyopia	15	48.27	13	51.73	28
Mixed amblyopia	1	50	1	50	2
Stimulus deprivation amblyopia	1	50	1	50	2

Among various ocular morbidities found in those with amblyopia, simple myopia was the commonest, it was cause found in 69% of those with Amblyopia. While mixed astigmatism was found in 9% of those with the outcome, the rest of the diseases like simple hypermetropia, corneal opacities, ptosis have been found at a similar proportion of 3%, there are 2 (6%) cases where amblyopic cases have multiple ocular morbidities occurring together. (Table 3)

Table 3: Distribution of various ocular morbidities in children with Amblyopia

EYES	OCULAR MORBIDITIES	COUNT	PERCENTAGE
Right Eye	Simple Myopia	10	30.3%
	Squint	1	3.0%
Left Eye	Cornea Opacity	1	3.0%
	Simple Myopia + Squint	1	3.0%
	Simple Hypermetropia	1	3.0%
	Simple Myopic Astigmatism	1	3.0%
	Mixed Astigmatism	1	3.0%
	Congenital Hydrocephalus	1	3.0%
Both Eye	Ptosis	1	3.0%
	Simple Myopia	13	39.4%
	Simple Hypermetropia Astigmatism + Ptosis + Squint	1	3.0%
	Mixed Astigmatism	1	3.0%
	Total	33	100

Amblyopia is similarly distributed across those in primary (0.8%), middle (1%) and secondary (1%) schools, but those in higher secondary (6.7%) have a much higher proportion compared to other groups. Males (0.9%) and female (1%) students were affected in similar proportions by the outcome. More proportions (2.6%) of those in ages 15-17 were affected by the outcome compared to other age groups like 5-9 (0.7%), 10-14% (1.2%), higher proportions of those living in nuclear (1%) and joint families (0.9%) are affected by the disorder compared to those living with a single parent (0) or

a guardian (0).

DISCUSSION

Our study comprised of school going children from ages 5-19, from rural background in Tamil Nadu's Tirunelveli district. The prevalence of amblyopia in our study was 0.96% which is comparable to studies conducted all over the world (1.36%-2.66%). (4) A study done to estimate prevalence of amblyopia among school going children in Qassim province, KSA showed a higher prevalence rate of 3.9%. (7) A systematic review estimates pooled prevalence of amblyopia worldwide among children was 1.36%, specifically in Asia it was estimated to be 1.16% which is in line with our findings.⁸ In our study, bilateral amblyopia (45.45%) was slightly less than unilateral amblyopia (54.55%), which is common and similar to study done in rest of India including one done in Andhra Pradesh by K Anjaneyulu et al., and Kerala by Menon et al., where 7% cases were bilateral. (6,8,9) but our study only shows a small difference between them, while other studies have recorded a larger gap. Our study had similar proportions of males (45.46%) and females (54.54%) being affected, the slight difference can also be largely attributed to slightly larger amounts of female participants in the study.

Anisometric type of amblyopia was the commonest type similar to many other studies (6,9,10) the most common cause of anisometropia was myopia, which was the only cause found in 69% of those with Amblyopia. While mixed astigmatism can be attributed for 6% of the outcome, the rest of the causes like simple hypermetropia, corneal opacities, ptosis have contributed 3% each, there are 2 (6%) cases where amblyopia can be attributed to multiple etiological factors. Many other studies have astigmatism as the primary cause of amblyopia. (6,10) The most important cause of stimulus deprivation amblyopia in our study was ptosis and corneal opacities. Anisometropia being the most prominent is very important finding as this is most easily treatable type.

CONCLUSION

The prevalence of amblyopia that was identified was mostly in line with a few other studies done in India, but amblyopia is a rarely studied phenomenon and we need more studies from different parts of India to understand the real burden of the issue. We recommend educating parents on the importance of early vision assessment for their children and the need for follow-up to prevent amblyopia. Screening and providing early treatment for the children with refractive error significantly reduces the load of amblyopia which does happen though several public health programs with great

foresight but care should be taken to ensure interventions well received by the students who had been subscribed glasses, this could also be done by educating teachers on the importance of the same. Those studies who were found with issues though our study were appropriately treated at Tirunelveli Medical College and Hospital.

REFERENCE

1. Sachin Daigavane, & Madhumita Prasad. (2018). To observe the proportion of amblyopia among children presenting in a rural hospital in Central India. 13(3), 119–121.
2. Aldebasi, Y. H. (2015). Prevalence of Amblyopia in Primary School Children in Qassim Province, Kingdom of Saudi Arabia. Middle East African Journal of Ophthalmology, 22(1), 86–91. <https://doi.org/10.4103/0974-9233.148355>
3. NIPA R. DOSHI, & MARIA LOURDES F. RODRIGUEZ. (2007). Amblyopia. Am Fam Physician, 75(3), 361–967.
4. Zongshun Liu, Budan Hu, Jiao Zhao, Li Zeng, Gengsheng Hao, Dan Shui, & Ke Mao. (2022). The Global Prevalence of Amblyopia in Children: A Systematic Review and Meta-Analysis. Frontiers, 10. <https://www.frontiersin.org/articles/10.3389/fped.2022.819998/full>
5. Sachin Daigavane, & Madhumita Prasad. (2018). To observe the proportion of amblyopia among children presenting in a rural hospital in Central India. 13(3), 119–121.
6. Anjaneyulu K, Narendranath Reddy G. Prevalence of Amblyopia in Children Aged from 5-15 Years in Rural Population Kurnool Dist. Andhra Pradesh, India. IJSR. 2015;4:99–100.
7. Aldebasi, Y.H. (2015) Prevalence of amblyopia in primary school children in Qassim Province, Kingdom of Saudi Arabia, Middle East African journal of ophthalmology. U.S. National Library of Medicine. Available at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4302483/#__ffn_sectitle (Accessed: November 21, 2022).
8. Hashemi HM, Pakzad RM, Yekta AP, Bostamzad PM, Aghamirsalim MM, Sardari SM, et al. Global and regional estimates of prevalence of amblyopia: a systematic review and meta-analysis. Strabismus. (2018) 26:168–83.8.1080/09273972.2018.1500618
9. Selcuk AA. A guide for systematic reviews: Prisma. Turk Arch Otorhinolaryngol. (2019) 57:57–8. 10.5152/tao.2019.4058.
10. Menon V, Chaudhuri Z, Saxena R, Gill K, Sachdev MM. Profile of amblyopia in hospital referral practice. Indian J Ophthalmol. 2005;53:227–34.
11. Shapira Y, Machluf Y, Mimouni M, Chaïter Y, Mezer E. Amblyopia and strabismus: trends in prevalence and risk factors among young adults in Israel. Br J Ophthalmol. 2018 May;102(5):659-666. doi: 10.1136/bjophthalmol-2017-310364. Epub 2017 Aug 16.
12. Zagui, R.M.B. (2019) Amblyopia: Types, diagnosis, treatment, and New Perspectives, American Academy of Ophthalmology. Available at: <https://www.aaao.org/disease-review/amblyopia-types-diagnosis-treatment-new-perspectiv> (Accessed: November 22, 2022).

VACCINE HESITANCY AMONG TRIBAL KHASI COMMUNITY IN MAWPHLANG PROVINCE OF MEGHALAYA: A MIXED METHODS CROSS SECTIONAL STUDY CONDUCTED IN JANUARY TO MARCH 2021

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Abstract

RATIONALE : As the COVID 19 vaccine uptake in Meghalaya is quite low compared to the rest of India this knowing their perception on the same will help us counter the issue.

METHODS : A Cross sectional study using mixed methods in Ten villages chosen in Adult Khasi population of Mawphlang province in Meghalaya with Sample Size of 300.

RESULTS : 8.8% of those surveyed were vaccinated, 88.4% of those surveyed were hesitant to take the vaccine, included those who are already vaccinated and obviously willing, 2.6 % of those surveyed among those who were unvaccinated were willing to get vaccinated now. 2.6 % of those parents who were surveyed were willing to let their children get vaccinated. Major reasons identified for vaccine hesitancy include religious reasons, fear of side effects, ignorance about it's benefits etc.

CONCLUSION : The vaccine hesitancy for Covid 19 vaccinations was high in this area (88.4%), the reasons identified for vaccine hesitancy lack of knowledge, fear of side effects and religion, the best approach to increase coverage in this area is health education, involving all key stakeholders especially religious and Tribal leaders.

KEYWORDS : Khasi population, vaccine hesitancy, Covid 19 vaccination, Tribal leaders

INTRODUCTION

SARS-CoV-2 virus causes an illness called Covid 19. Those that get infected with the will develop mild to moderate illness that affects the respiratory system. Only rarely will people become seriously ill and require special medical attention. Older folks and those with chronic medical conditions like cardiovascular disease, diabetes etc. are more prone to develop serious illness. Anyone can get sick with COVID-19 and become seriously ill or die at any age. ¹

GLOBAL STATISTICS :

As of 9th December 2021, 260 million documented cases of COVID-19 have been documented all over the world, including 5.2 million deaths. South East Asia alone had 44 million documented cases of COVID 19. USA had the largest number of cases for a single country with 49 million cases and 7 lakh deaths. As of 10th July 2022 551,226,298, confirmed cases of COVID-19, including 6.3 million deaths, have been reported to WHO. ²

INDIAN STATISTICS :

India had 34 million confirmed cases and 4 lakh documented deaths as of December 9th 2021. ² The state of

Maharashtra has 66 million confirmed COVID cases, most of them already recovered and the state also experienced the most deaths due to the pandemic. The state of Meghalaya as of now has a confirmed case tally of 84643 with 1476 deaths. As of July 7th 2022. ³

VACCINATION STATISTICS :

India has managed to vaccinate 133 crore population among whom 810 million had received first dose vaccination, and 510 had received the second dose of vaccination this data was from December of 2021. In Meghalaya has vaccinated 11,95,000 people at least a single time and 8,49,997 second dose vaccinations. The above-mentioned data is of December the 13th in the year 2021. ⁵

MEGHALAYA DEMOGRAPHIC INFORMATION:

Meghalaya has a population of 2.9 million according



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to 2011 census out of which predominant number of the population are scheduled tribes (86%). There are 1.42 million males and 1.47 million females. Most of the people who live in the rural areas (23 million). The literacy rate among men and women are seventy five percent and seventy two percent respectively. Khasi are the most prominent tribal group in Meghalaya, comprising of 34 % of the population. ⁶

LITERATURE REVIEW

VACCINE HESITANCY :

The common factors associated with vaccine hesitancy include, a lower fear for health and fear of COVID-19, a belief of lower risk of contracting COVID-19, believing that COVID-19 is not severe, having low trust in health system and thinking that vaccination is useful were most commonly studied links with increased vaccine hesitancy. Influenza vaccination taken prior was the most common determinant associated with lower vaccine hesitancy. A total of 10 themes were found for vaccine related determinants. ^{10,11,12}

For communications and media environment factors, the use of social media or internet as a main source of information and the lack of widely accessible information on COVID-19 vaccination were associated with vaccine hesitancy. Other notable factors associated with vaccine hesitancy included healthcare workers in non-clinical roles, increased religiosity, residing in rural areas, reduced trust in government and pharmaceutical industry, and increased passage of time in a pandemic. ^{13,14,15,16}

Respondents with low socio-economic status, those without a job and education constituted the primary reason for vaccine hesitancy and resistance ^{17,18}. In our study, females and the younger age group were more vaccine hesitant. Dube et al. reported that young individuals have an active immune status and are seldomly associated with severe forms of viral illnesses; hence, they tend to deny vaccination in a large proportion of cases ¹⁹. This misnomer can be addressed by conducting active seminars/webcast talks by senior professional faculty members citing the advantages of vaccine administration. The COVID-19 behavioral aspects were also important to be noted. Respondents who were serious in adhering to COVID-19 preventive and safety measures had strong intentions for vaccine administration ²⁰. An individual who would download the COVID-19 update mobile app was more likely to intend to be vaccinated. An individual who was more serious about maintaining social distancing in public places had 7% higher intentions to be vaccinated.

Previous studies have shown the importance of societal

disagreements and anti-vaccine groups mainly associated with vaccine hesitancy or resistance ^{21,22}. This has been the main concern even in our study. The respondents who considered COVID-19 more of an exaggerated disease, along with individuals who had dissent with their government's approach to fighting COVID-19, composed a significant percentage of vaccine-hesitant or resistant cases. This also included respondents who had no positive sense of their regional COVID-19 healthcare facility ^{23,24}.

COVID 19 VACCINE HESITANCY AMONG TRIBAL COMMUNITIES IN INDIA :

COVID-19 vaccine hesitancy among indigenous people of India is also challenging. Rumors about the development, efficacy, and reliability of COVID-19 vaccines made Adivasi people hesitant to take the COVID-19 vaccines. Some of the indigenous people of India consider the COVID-19 vaccines as ineffective to combat this deadly disease. Some believe that vaccines cause infertility and other problems and some think that vaccines can increase the susceptibility to become infected with COVID-19. ²⁵

It is also believed by people of different tribes of India that vaccines are not safe and they can even increase the mortality rate. Indigenous people of India usually don't trust the government officials due to economic and healthcare inequalities among these tribal communities, which is also a major factor contributing to vaccine hesitancy among them ²⁶.

Unequal distribution of the COVID-19 vaccines between big cities and tribal areas of India has also been an emerging problem for the indigenous people. This is due to the lack of technological literacy in these people and the poor availability of proper refrigeration facilities required for the storage of some vaccines. Indigenous people of India also do not know how to use the vaccine registration portal, such as Co-WIN, which may also hamper vaccination drive in these areas. ²⁷

COVID 19 VACCINE HESITANCY FOR CHILD VACCINATIONS :

In a survey conducted in USA 62.6% of parents were willing to have a domestic vaccine, while only 33.9% were willing to have a foreign vaccine. A study by Reiter et al found that nearly 70% of adults in the United States would be willing to accept a COVID-19 vaccine. ⁶ Yilmaz Bas et al determined that approximately 74% of the participants in their study would get a COVID-19 vaccine. ³¹ In the present study, the preference of participants with a history of vaccine rejection for the domestic vaccine was significantly higher. Since there are vaccine development studies underway in different centers in Turkey, it is essential for the national immunization program to recognize the preference for the

domestic vaccine, which was demonstrated in this study for the first time.³²

When the attitude toward vaccination was examined according to gender, the acceptance rate for domestic and foreign vaccines was found to be higher in men. Detoc et al also found that men were more accepting of vaccines than women.³³

RATIONALE

Meghalaya is a state that is predominantly occupied by Scheduled tribes, they make 86.15 % of the state's population. The Covid 19 vaccination rates in Meghalaya are 40.30% and 28.64 % for the first and second dose of Covid respectively, this is less than the Indian vaccination rate of India as of December 13th 2021, which is 58.69 % and 37.41% for first and second doses. This is attributed to its predominantly tribal population.

So, it's important to understand their perception on Covid 19 vaccination. In future, children will also need to be vaccinated and parents may have fears that might serve as a hindrance to the Covid 19 vaccination process. Khasi being one of the most predominant tribes in the Meghalaya and them inhabiting the East Khasi hills, it will be important to understand their perspective on COVID-19 vaccination. On the other hand, to ensure the safety and efficacy of the already existing vaccines and newer vaccines, the community's vaccination and follow-up data is necessary. A few institutes also realize a need to conduct vaccine trials in tribal population. Hence, we need to also understand their perception and willingness to participate in the Covid 19 vaccine trials.

AIM

To understand the prevalence of vaccine hesitancy and reasons for the same of tribal Khasi community for COVID 19 vaccinations for themselves and their children.

OBJECTIVE

To estimate the prevalence of vaccine hesitancy for COVID 19 vaccination among tribal Khasi community in Meghalaya.

To describe the reasons for vaccine hesitancy.

MATERIALS AND METHODS

STUDY DESIGN : A cross sectional study- mixed methods.

A convergent parallel design was used by us, for collecting quantitative and qualitative data at the same time. They were then analysed separately. We then combined both the results

and compared them overall conclusion.

We decided a mixed method study was considered the best option in this for this research question because, since we were primarily trying to find how many Khasi adults in Meghalaya were willing to vaccinate themselves, we could have just used descriptive statistics but this data, we thought would not be useful from a public health perspective without understanding their perceptions on the same, in order to figure out a solution, to a possible survey outcome like low willingness to take up the vaccine. This also holds true for our secondary objective which is to estimate the willingness of the same study population to participate in clinical trials, because ultimately to improve clinical trial participation rate we'll need to know the participant's perception on the same. Having a well layered qualitative data gives a good context to the quantitative data collected.

STUDY AREA : The study was conducted among tribal community adults in Mawphlang, East Khasi hills Meghalaya. The district comprises of 2 blocks and 207 villages. Mawphlang Block of East Khasi Hills district has total population of 71,491 as per the Census 2011. Out of which 35,331 are males while 36,160 are females. In 2011 there were total 13,117 families residing in Mawphlang Block. Mawphlang block has 104 villages, we decided to take 10 villages based on convenience sampling.

STUDY PARTICIPANTS : The people from Khasi community living in Mawphlang province in East Khasi hills in Meghalaya who are over 18 years of age and under 75 years of age. From ten randomly chosen villages in the district.

SAMPLING METHOD: Mawphlang village was selected as a study site through convenience sampling, out of which we had selected ten villages through convenience sampling from 104 villages present in Mawphlang block in East Khasi Hills, around 300 participants within the age group of 18 to 75 were surveyed through a pre tested and piloted questionnaire, we used quota sampling to split the 300 participants among the 10 selected villages equally, hence 30 participants were surveyed in each village. With the help of INCLEN Trust International field workers were hired, who enumerated the selected villages, in order to conduct a door-to-door survey. The house hold to start the survey in a village was picked through a random number generator, from there the field workers kept travelling leftwards to each house. From the willing adult Khasi participants who are the primary sampling unit, those who fell into the eligibility criteria were surveyed through systematic random sampling until 30 participant limit was reached per village, only one adult per household was surveyed.

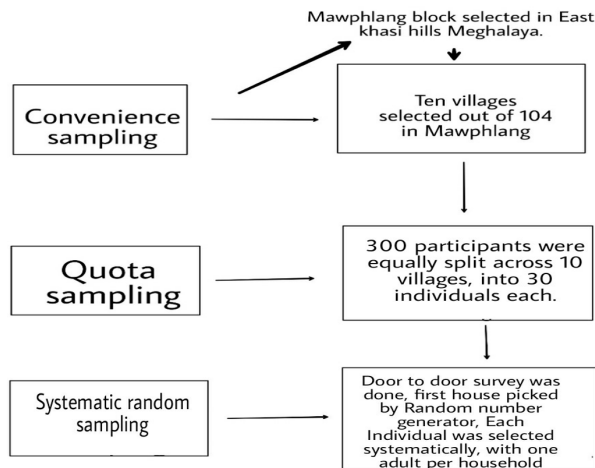


Figure 1: Sampling Method

SAMPLE SIZE ESTIMATION : The primary outcome is willingness vaccinate for Covid 19 vaccination in among those who are unvaccinated.

The sample size has been calculated by applying the formula:

$$N = \frac{Z^2 P (1-P)}{d^2}$$

Where:

n= sample size

Z= statistic corresponding to CI (95%)

P= expected prevalence

d= precision

Prevalence was taken as 50% as there aren't studies available that have calculated the willingness of tribal populations in Meghalaya to get vaccinated twice, A sample size of 273, with 90% CI and 5% margin of error was calculated. Keeping 10% for non-response, a final sample size of 300 was calculated.

DATA COLLECTION : Data was collected through paper based semi-open-ended questionnaire designed for the study, to collect quantitative as well as qualitative information, the qualitative data was collected as numbers and categories, while qualitative data was collected using open ended questions. We pre-tested the self-made questionnaire, after translating it to local language; necessary changes were made prior to use for the main study. Participants included in pilot study were not considered for the final study. The data was collected through door to door survey by trained field workers who were two in number, who had all passed higher secondary school, and knew English and the local language Khasi quite well, the questionnaire was administered by the

field workers to adults who fell in our eligibility criteria, after obtaining necessary consent. In order to reduce error during data collection one person looked while the other wrote down the information.

The questionnaire that we made collected data on socio-demographic aspects, history of covid infections, covid vaccination status, if a person has not taken the COVID 19 vaccine then we proceed to ask question on willingness to take the vaccine for them, open ended question on the Individual's knowledge and perception of COVID 19 vaccination. If the person had a child, then we asked them about their willingness to allow their children to the vaccine if the government eventually allowed the vaccine to be given to all age groups.

Since we collected on printed questionnaires, we had to manually enter the data in Microsoft excel sheet on a daily basis on one computer that was be password protected, the data was entered and then cross checked by another person in order to reduce errors. The electronic data was be password protected and was accessible only to the investigators (Dr Sudharsan and Dr Samiksha Singh). We had cleaned, coded, labelled and arranged prior to analysis. We had ensured safe keeping of the paper forms and signed informed consent forms.

DATA ANALYSIS : The Data analysis was performed using STATA 16, vaccine hesitancy was calculated in percentage and frequency. Thematic analysis of data was done to make meaningful conclusions from the in-depth interviews. ecial children home.

ETHICAL CONSIDERATIONS : This study was be undertaken after obtaining necessary approvals from the Institutional Ethics Committee at Indian Institute of Public Health-Delhi. All participants were explained about the purpose of the study in simple language using the Participant Information Sheet (PIS) in local language.

STUDY COORDINATION AND FUNDING : This study was undertaken with guidance and overall supervision by Dr Samiksha Singh, "Additional Professor, Indian Institute of Public Health-Delhi". It was be done in collaboration with INCLEN trust international in Meghalaya, DR Vaishali (Senior Program Manager) was helpful in facilitating the project from the side of INCLEN trust. The study was be funded by INCLEN trust international.

RESULTS

The analysis was done on 300 observations. There were missing values in a few of variables, number of missing values has been listed in the bottom of the table.

Table 1 :Socio-demographic characteristics of the participants

Characteristics	N (%)
Location	
1. Mawngap Rim	30 (10%)
2. Mawngap khlieh shnong	30 (10%)
3. Mawngap mawsmmai	30 (10%)
4. Marbisu mawsmmai	30 (10%)
5.Sawlad Marbisu	30 (10%)
6.Ummylle	30 (10%)
7.Khar la khar	30 (10%)
8.Nongrum Mawphlang	30 (10%)
9.Mission Mawphlang	30 (10%)
10.Traw saithkhlieh.	30 (10%)
Age in years (Mean \pm SD)	36 (\pm 13.8)
Sex	
Female	167 (55.6%)
Religion ^^	
Christians	246 (91.1%)
Non-Christians	24 (8.8%)
Education &&	
1. No school education	37 (14.6%)
2.Primary school	30 (11.8%)
3. Middle school	31 (12.2%)
4. Secondary and higher secondary	103 (40.7%)
5. Graduation and above	51 (20.1%)
Occupation **	
1.Unemployed	11 (4.1%)
2. Self employed	39 (14.6%)
3. Daily wage worker	44 (16.4%)
4. Student	59 (22.1%)
5.Agricultural labor	6 (2.2%)
6. Home makers	91(34.4%)
7. Salaried Service	16 (4.9%)
Marriage ++	
1. Married	200 (67.8%)
2. Unmarried	60 (20.3%)
3. Widowed	35 (11.8%)

Missing values - (^^)- 30, (&&)-47, (**)- 33, (++)- 5.

A total of 300 participants were recruited into the study. Equal number of participants were interviewed from the ten randomly chosen villages in Mawphlang province of east Khasi hills. The mean (\pm SD) age of the study participants was 36 years (\pm 13.8). Majority of those who were interviewed were female participants (n= 167) (55.6 percent). Out of 300, majority of the participants were educated, amongst which primary education was received by 30 (11.8%), middle school education 31 (12.2%), secondary and higher secondary education by 103 (40.7 %) and graduation and higher 51 (20.1 %). The illiterate participants were 37 (14.6 percent). Majority of participants who were interviewed were homemakers 91 (34.4%), students 59 (22.1%), daily wage workers 44 (16.4%) and self-employed 39 (14.6%) also constituted a large chunk of the participants. Those who were unemployed among those interviewed were 11 (4.1%). The people who worked salaried jobs in an office were 16 in number close to 5% of the population. The people who participated in the study were predominantly Christians 246 (91.1%), the rest were non-Christians.

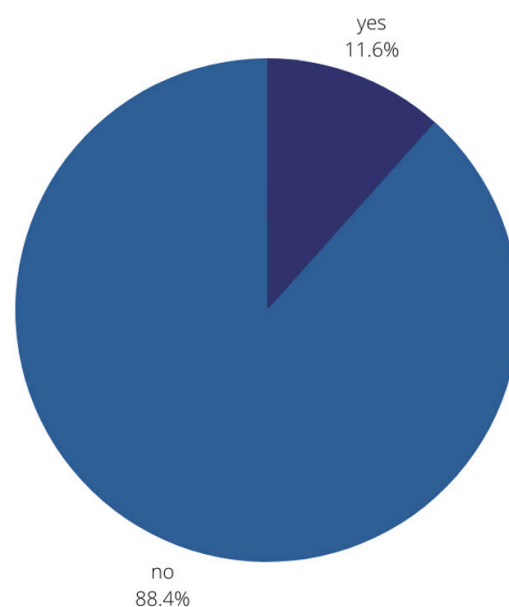


Figure 2: Vaccine hesitancy

Willingness to take for COVID 19 vaccine among those surveyed, vaccine hesitancy was found in 88.4% of those surveyed, but this includes those that are already vaccinated, among the unvaccinated only 2.6% were willing to get vaccinated, hesitancy was 97.4% among this demographic.

Among those surveyed percentage of those that had done schooling below middle school (0- 2.8%) among those willing to get vaccinated, seem less when compared to those who have studied middle school or above (2-5.9%). Higher

percentage of Students (5%) and home makers (4.5%) were willing to get vaccinated than the other occupational groups. More percentage of unvaccinated females (4.8%) more inclined to get vaccinated than males (2.9%). More percentage of unvaccinated unmarried women (2.6) are willing to get vaccinated for Covid 19, compared to married (2.6) or widowed ones (2.6%).

Table 2 : Perception on COVID 19 vaccination

THEMES	CATEGORIES	CODES
COVID 19 Vaccine hesitancy	1. Unsure of benefits	1. It's unnecessary 2. Vaccine can't stop Covid 19 3. Not needed as I don't travel 4. Those who take the vaccine also get covid 19 5. Just a farmer, don't need the vaccine 6. Already old don't need the vaccine 7. We are not scared of the virus anymore
	2. Religious beliefs	1. Belief in God over science 2. God will take care of us 3. We should not interfere with God's plan 4. God is my vaccine 5. Our faith doesn't allow us to use vaccine
	3. Fear and mis trust	1. It's a conspiracy to cause them harm 2. Afraid of side effects 3. Covid 19 causes death 4. It can affect work because of side effects
COVID 19 Vaccine autonomy	4. Leave it to individual's choice	1. It should not be forced 2. Will take it if I feel like it 3. It should be my choice when to take vaccine 4. I will not take because they are forcing me
	5. Make it mandatory	1. Will take if made mandatory at work 2. Will take if everyone takes it 3. Will take if my parents take 4. Will take if made mandatory at school 5. Will take if government makes it compulsory to take vaccine to sell in market
Need further information	6. Rumors and fake information	1. Unsure about the benefit of the vaccine 2. Concerned about the effects of vaccine 3. Read that the vaccine causes death on WhatsApp 4. They're saying the C-19 vaccine is just water
	7. Health education and health promotion	1. Need more information before taking the vaccine 2. Don't know how vaccine works 3. Don't know difference between various vaccines not sure what to take 4. If people are more aware it will help to take more vaccine 5. The community needs more awareness 6. Government should try and educate the population

The most important themes identified for vaccine hesitancy include unsure of benefits, religious beliefs and fear and mis-trust of Covid 19 vaccine and government organizations.

Themes identified for vaccine autonomy were conflicting while a large number of people wanted the government to leave the right to choose to get vaccinated or not for covid to the choice of individuals, a small number of folks were in the belief that they will get vaccinated only if it is mandatory in their workplace and study or by the government. To address the issue or vaccine hesitancy and improve coverage, there needs to be sufficient measures in place to address rumors regarding the vaccine. Health promotion activities and health education should campaigns should be initiated among the population to address the issue of vaccine hesitancy.

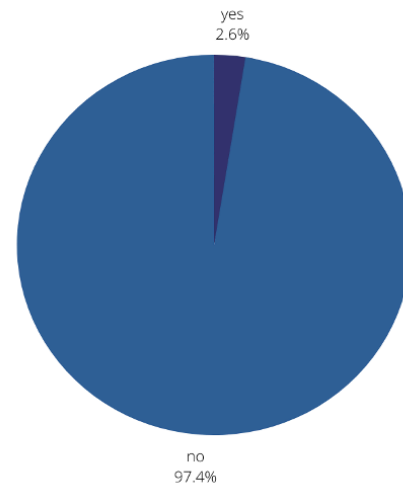


Figure 3 : Willingness to get their children vaccinated

Table 3 : Willingness to get their children vaccinated

Child Covid 19 vaccine	N (%)
YES	4 (2.6 %)
NO	147 (97.4 %)

Only 2.6 % of the parents who were surveyed were willing to get their children vaccinated.

Among those parents who were surveyed those who have graduated had more percentage (9.7%) of the population who are willing to let their children get vaccinated. Those who worked in offices (9.1%) and those who owned business (8%) had more percentage of those who were willing to get their children vaccinated compared to other occupational groups. Christians (2.5%) had more percentage of those who were willing to let their children get vaccinated compared to non- Christians. There is no significant relationship between the child's age and willingness to get their children vaccinated just like every other variable tested.

Major reasons/ themes identified for hesitancy to vaccinate

their children were fear of side effects, wanting to wait and watch, religion and God.

Table 4 : Reason for hesitancy

Themes	Categories	Codes
Reason for hesitancy to vaccinate children for Covid 19	Fear of side effects	1. It's a conspiracy by the government. 2. Afraid of side effects on my children 3. My child is too young
	Wait and watch	4. Unsure about it 5. Need more information to decide 6. Will wait until other children are vaccinated.
	Religion and God	7. Religious beliefs does not allow me 8. I believe my God will protect my children

DISCUSSION

The COVID-19 pandemic is considered one of biggest threat to public health to Indians and the rest of the world. The virus has spread to 200 countries and is still not fully under control. Many countries across the world have tried several methods to control the spread of the infection; not many of them have been actually been successful in reducing the impact of the problem. Safe COVID-19 vaccines have been developed. Vaccine acceptance is important to herd immunity, vaccine hesitancy is a big barrier particularly in low-middle-income countries.

We had surveyed 300 individuals located in ten villages in Mawphlang block in Meghalaya, the block and the villages were chosen as per convenience sampling, while the number of participants to be recruited into the study was decided based on the proportion of willingness among the population for COVID 19 vaccination from a study based in India. The participants at village level were recruited using systematic sampling, with one adult selected per household, quota sampling was used to set limits per each village, door to door data collected was done by trained fieldworkers who had completed schooling. Our primary objectives were to estimate the willingness of the people in Meghalaya to take COVID 19 vaccinations.

The mean age of those who were surveyed was 36 (+/- 13), the percentage of females (55%) who were surveyed is slightly higher than males. Almost 60% of the sample had passed high school, one third of those who were surveyed were homemakers, the rest were predominantly agricultural laborers or daily wage workers. A large fraction of them were married. Almost all the population were Christian except 8.8% who were non- Christians.

Irrespective of the educational classes most of the participants have not been vaccinated uniformly. While in occupational groups, those who belong to salaried service category were proportionately better off while compared to other occupational groups. Those who were unemployed

or worked in farms they were not vaccinated at all. The vaccinated percentage among non-Christians was, in this cases male had a slight edge over the females. None of the associations were found to be significant (p>0.05).

Among surveyed population, only 11.6 % (88% were hesitant) of the people who were surveyed were willing to take COVID 19 vaccinations.

The most important themes identified for vaccine hesitancy include unsure of benefits, religious beliefs and fear and mistrust of COVID 19 vaccine and government organizations. Themes identified for vaccine autonomy were conflicting while a large number of people wanted the government to leave the right to choose to get vaccinated or not for COVID 19 to the choice of individuals, a small number of folks were in the belief that they will get vaccinated only if it is mandatory in their workplace and study or by the government. To address the issue of vaccine hesitancy and improve coverage, there needs to be sufficient measures in place to address rumors regarding the vaccine. Health promotion activities and health education campaigns should be initiated among the population to address the issue of vaccine hesitancy.

Among those parents who were surveyed those who have graduated had more percentage (9.7%) of the population who are willing to let their children get vaccinated. Those who worked in offices (9.1%) and those who owned business (8%) had more percentage of those who were willing to get their children vaccinated compared to other occupational groups. Christians (2.5%) had more percentage of those who were willing to let their children get vaccinated compared to non- Christians. There is no significant relationship between the child's age and willingness to get their children vaccinated just like every other variable tested.

LIMITATIONS

The study was done in a predominantly rural setting where a large amount of Khasi people lived this might be applicable to Khasi population in Meghalaya in general as those living in Urban areas might have different perceptions on the same. Since the issue of vaccinations is an extremely sensitive topic in this area In-depth interview on the subjects was not received with certain level of skepticism, many questions on socio economic determinants were ignored, hence there were a lot of missing data.

RISKS

There were no risks associated with participating in the study since this was a noninvasive questionnaire-based survey.

BENEFITS

The direct benefits of participating in the survey was the participants were given health education regarding the benefits of vaccinating themselves and their children against COVID 19 towards the end of the interview. The data from the study can help identify the best possible approach to increase vaccine coverage in this area.

CONCLUSIONS

The vaccine hesitancy for Covid 19 vaccinations was high in this area, the reasons identified for vaccine hesitancy lack of knowledge, fear of side effects and religion, the best approach to increase coverage in this area is health education, involving all key stakeholders especially religious and Tribal leaders.

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REFERENCES

1. M, Asampong E, Fobil JN (2013) 'Working conditions and environmental exposures among electronic waste workers in Ghana'. *Int J Occup Environ Health* 19(4): 278–286.
2. Ali D, Elsheikh M, Khalid M, Momen A (2015) 'Trace elements in scalp hair and fingernails as biomarkers in clinical studies'. *Journal of Health Specialties* 3(1): 28-34.
3. Annamalai J (2015) 'Occupational health hazards related to informal recycling of E-waste in India: An overview'. *Indian J Occup Environ Med* 19(1): 61-65.
4. Awasthi AK, Zeng X, Li J (2016) 'Relationship between e-waste recycling and human health risk in India: a critical review'. *Environ Sci Pollut Res Int* 23(12): 11509–11532.
5. Awasthi AK, Li J (2018) 'Assessing resident awareness on e-waste management in Bangalore, India: a preliminary case study'. *Environ Sci Pollut Res Int* 25(11): 11163–11172.
6. VBorthakur A, Sinha K (2013) 'Electronic Waste Management in India: A Stakeholder's Perspective'. *Electronic Green Journal*, 1(36) [Online]. Available at: <https://escholarship.org/uc/item/1cq3j0b0#author> [Accessed: 25th March 2019].
7. Burns KN, Sun K, Fobil JN, Neitzel RL (2016) 'Heart Rate, Stress, and Occupational Noise Exposure among Electronic Waste Recycling Workers'. *Int J Environ Res Public Health* 13(1):140.
8. Census Population Finder (2011) Office of the Registrar General & Census Commissioner, India Ministry of Home Affairs, Government of India. [Online]. Available at: <http://censusindia.gov.in/pca/Searchdata.aspx> [Accessed: 20th October 2018].
9. Chi X, Streicher-Porte M, Wag MYL, Reuter MA (2011) 'Informal electronic waste recycling: a sector review with special focus on China'. *Waste Manag* 31(4): 731-742.
10. Chylińska J, Łazarewicz M, Rządkiwicz M, Adamus M, Jaworski M, Haugan G, Lillefjel M, Espnes GA, Włodarczyk D (2017) 'The role of gender in the active attitude toward treatment and health among older patients in primary health care—self-assessed health status and sociodemographic factors as moderators'. *BMC Geriatrics* 17(1): 284.
11. Fitzsimmons J (2015) 'Analytical method Validation: ICP-OES', *Journal of Analytical Atomic Spectrometry*. The Royal Society of Chemistry 2015. [Online]. Available at: <http://www.rsc.org/suppdata/c5/ja/c5ja00419e/c5ja00419e1.pdf> [Accessed: 25th October 2018]
12. Frazzoli C, Orisakwe O, Dragone R, Mantovani A (2010) 'Diagnostic Health Risk Assessment of Electronic Waste on the General Population in Developing Countries' Scenarios. *Environmental Impact Assessment Review* ' ENVIRON IMPACT ASSESS REV 30: 388-399. Grant K, Goldizen FC, Sly PD, Brune MN, Neira M, van den Berg M, Norman RE (2013) 'Health consequences of exposure to e-waste: a systematic review'. *The Lancet Global Health* 1(6): e350–e361.
13. Google Earth (2019). [Online]. Available at: <https://www.techspot.com/downloads/1018-google-earth.html> [Accessed on 3rd April, 2019].
14. Ha NN, Agusa T, Ramu K, Tu NPC, Murata S, Bulbule KA, Parthasarathy P, Takahashi S, Subramanian A, Tanabe S (2009) 'Contamination by trace elements at e-waste recycling sites in

Bangalore, India. *Chemosphere* 76(1): 9-15.

15. Henríquez-Hernández LA, Boada LD, Carranza C, Pérez-Arellano JL, González-Antuña A, Camacho M, Almeida-González M, Zumbado M, Luzardo OP (2017) 'Blood levels of toxic metals and rare earth elements commonly found in e-waste may exert subtle effects on hemoglobin concentration in sub-Saharan immigrants.' *Environ Int* 109: 20-28.

16. How to Cut A Hair Sample For Analysis | Moses Nutrition (2016) [Online]. Available at: http://www.mosesnutrition.com/how_to_cut_a_hair_sample/ [Accessed: 16th October 2018]. International Labour Organization (2011) The Factories Act, India. [Online]. Available at: <https://www.ilo.org/dyn/natlex/docs/WEBTEXT/32063/64873/E87IND01.htm> [Accessed: 26th March 2019].

17. Isimekhai KA, Garelick H, Watt J, Purchase D (2017) 'Heavy metals distribution and risk assessment in soil from an informal e-waste recycling site in Lagos State, Nigeria.' *Environ Sci Pollut Res In* 24(20): 17206–17219.

18. Julander A, Lundgren L, Skare L, Grandér M, Palm B, Vahter M, Lidén C (2014) 'Formal recycling of e-waste leads to increased exposure to toxic metals: an occupational exposure study from Sweden.' *Environ Int* 73: 243-251.

19. Khatriwal DS, Kraeuchi P, Widmer R (2009) 'Producer responsibility for e-waste management: key issues for consideration – learning from the Swiss experience.' *J. Environ. Manage* 90(1): 153-165.

20. Kumar R, Karishma (2016) 'Current Scenario of e-waste management in India: issues and strategies.' *International Journal of Scientific and Research Publications* 6(1): 424-430.

21. Kumar S, Smith SR, Fowler G, Velis C, Kumar SJ, Arya S, Rena Kumar R, Cheeseman C (2017) 'Challenges and opportunities associated with waste management in India.' *R Soc Open Sci* 4(3): 160764.

22. Kwatra S, Pandey S, Sharma S (2014) 'Understanding public knowledge and awareness on e- waste in an urban setting in India: A case study for Delhi.' *Management of Environmental Quality: An International Journal*. 25(6): 752-765.

23. Lancet T (2013) 'Electronic waste—time to take stock.' *The*

Lancet 381(9885): 2223.

24. Liu Y, Huo X, Xu L, Wei X, Wu W, Wu X, Xu X (2018) 'Hearing loss in children with e- waste lead and cadmium exposure.' *Sci. Total Environ* 624: 621-627.

25. Lundgren MK (2012) *The global impact of e-waste: Addressing the challenge*, Geneva, Switzerland: International Labour Organization. [Online]. Available at: https://www.ilo.org/wcmsp5/groups/public/---ed_dialogue/---Sector/documents/publication/wcms_196105.pdf [Accessed: 6th June 2018].

26. Maheshwari RK, Rani B, Singh U (2013) 'Dribble of E-Waste: It's Impact on Human Health & Management Strategies for Sustainable Development.' *Research Journal of Chemical and Environmental Sciences* 1(2): 3-16. [Online]. Available At: <http://www.aelsindia.com/rjces.htm> [Accessed: 7th August 2018].

27. Maps of India (2019) [Online]. Available at: <https://www.mapsofindia.com/delhi/districts/> [Accessed: 10th April 2018].

28. Mikulewicz M, Chojnacka K, Gedrange T, Górecki H (2013) 'Reference values of elements in human hair: A systematic review.' *Environmental Toxicology and Pharmacology* 36(3): 1077- 1086.

29. Ministry of Environment, Forest and Climate Change (2011) *EWM Rules 2016: (E-waste Management Rules)*, New Delhi: Government of India. [Online]. Available at: http://www.moef.gov.in/sites/default/files/EWM%20Rules%202016%20english%2023.03.20_16.pdf [Accessed: 20th September 2018]

30. Mishra S, Shamanna BR, Kannan S (2017) 'Exploring the Awareness Regarding E-waste and its Health Hazards among the Informal Handlers in Musheerabad Area of Hyderabad.' *Indian J Occup Environ Med* 21(3): 143-148.

31. Needhidasan S, Samuel M, Chidambaram R (2014) 'Electronic waste – an emerging threat to the environment of urban India.' *J Environ Health Sci Eng* 12(1): 36-44.

32. Niculescu T, Dumitru R, Botha V, Alexandrescu R, Manolescu N (1983) 'Relationship between the lead concentration in hair and occupational exposure.' *Br J Ind*

Med 40(1): 67-70. Oguri T, Suzuki G, Matsukami H, Uchida N, Tue NM, Tuyen LH, Viet PH, Takahashi S, Tanabe S, Takigami H (2018) 'Exposure assessment of heavy metals in an e-waste processing area in northern Vietnam'. Sci. Total Environ 621: 1115-1123.

33. Ohajinwa CM, Van Bodegom PM, Vijver MG, Peijnenburg WJGM (2017) 'Health Risks Awareness of Electronic Waste Workers in the Informal Sector in Nigeria'. Int J Environ Res Public Health 14(8): 911-927.

34. Ohajinwa CM, Van Bodegom PM, Vijver MG, Peijnenburg

WJGM (2018) 'Impact of informal electronic waste recycling on metal concentrations in soils and dusts'. Environ Res 164: 385- 394.

35. Okoye A, Odoh C (2014) 'Assessment of the Level of Awareness of E-Waste Management and Concern for the Environment amongst the Populace in Onitsha, Southeastern Nigeria' Journal of Environmental Protection 5(2): 120-134.

36. Osibanjo O, Nnorom IC (2007) 'The challenge of electronic waste (e-waste) management in developing countries'. Waste Manag Res 26(6): 489-501.

REVIEW ARTICLE - PUBLIC HEALTH

CHALLENGES IN IMPLEMENTING COMMUNITY-BASED INTERVENTIONS FOR NON-COMMUNICABLE DISEASES: EXPERIENCES FROM TAMIL NADU MAKKALAI THEDI MARUTHUVAM (MTM) PROGRAM, 2021-22

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Abstract

BACKGROUND : Age of onset of NCDs in developing countries are lesser than developed countries. In India, half of the NCDs occur before the age of 52, suggesting that working adults are largely affected by NCDs. Many remain undiagnosed due to lack of awareness and insufficient access of health care services. Government of Tamil Nadu initiated “NCD-Makkalai Thedi Maruthuvam” (NCD-MTM) program with comprehensive package of doorstep services for ensuring continuum of care and sustainability of health care services. The interventions include screening for hypertension, diabetes, common cancers, delivery of NCD drugs, dialysis bags for CKD patients, home-based palliative care services and physiotherapy services. With one year of its implementation, we did a qualitative study to understand the challenges in its implementation. We reviewed the program documents, guidelines and review reports. We selected the stakeholders across all levels of care by purposive sampling and conducted in-depth interviews. We audio recorded, transcribed, generated codes, and did thematic analysis by free listing and pile sorting and identified seven thematic areas – Human Resources, screening of NCDs, referral linkages and follow-up, delivery of drugs, reporting system, monitoring and supervision, and IEC/BCC. Similar community-based interventions in other parts of the world have proved much more beneficial particularly involving primary health care staff compared to that of the standard care. Though the program had widely covered the target individuals, especially in drug delivery, and creating awareness, stakeholders have reported many challenges in implementation of the program. The most important areas of focus are the need of coordination among field level staff, uninterrupted supply of equipment and consumables, focus on follow-up and referral, effective reporting system, proper supervision plan and IEC/BCC strategies. Rectifying the reported challenges with appropriate solutions will make this program a successful model and will help in bringing desirable NCD outcomes.

KEYWORDS : Community-based intervention, doorstep health care services, drug delivery

INTRODUCTION

Children, adults and the elderly are all vulnerable to the risk factors contributing to NCDs, whether from unhealthy diets, physical inactivity, exposure to tobacco smoke or the harmful use of alcohol¹. Unhealthy diets and a lack of physical activity may show up in people as raised blood pressure, increased blood glucose, elevated blood lipids and obesity¹. Age of onset of NCDs in developing countries are lesser than developed countries. In India, half of the NCDs occur before the age of 52, suggesting that working adults are largely affected by NCDs².

STEPS survey 2020 in Tamil Nadu reported prevalence of HT and DM in adult population as 33.9% and 17.6%. Many remain undiagnosed due to lack of awareness and insufficient access of health care services³. The initiatives towards coping with the burden of NCDs in Tamil Nadu way back to 2003, when Government of Tamil Nadu developed Health policy aimed to combat non-communicable diseases and accidents⁴. Tamil Nadu Health Systems Project (TNHSP) implemented by Health and Family Welfare Department of Tamil Nadu supported the health policy with a focussed approach towards common NCDs⁵. In 2005, World Bank

approved the initiatives of TNHSP and, piloting was done on facility based opportunistic screening of two common NCDs - Hypertension and Cervical cancer, among population aged 30 years and above (30-60 years) between 2007 and 2010. Based on the experiences from the pilot, screening covering 4 NCDs – Hypertension, Diabetes, Cervical cancer and Breast cancer had been executed in phased manner covering all districts across the state till 2015.

During the year 2015, when TNHSP supported by World Bank resolved, the NCD programme across the state was sustained and taken forward under the National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases and Stroke (NPCDCS), by the State NCD cell under National Health Mission (NHM) in Tamil Nadu⁶. Subsequently, in 2017, NHM-TN took up the



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concept of NPCDCS - Population Based Screening (PBS) initially piloting in 5 districts and then upscaled to the entire State⁶. Other community-based interventions undertaken by the state includes Patient Support Group (PSG) in 2019 to improve treatment compliance of HT and DM patients.

During the COVID-19 pandemic amidst the lock down, entire world faced challenges in ensuring patients reaching health facilities for follow-up and in dispensing monthly drugs for HT and DM. To overcome this, efforts were taken to support NCD patients to be compliant by distributing their medicines at their doorsteps in few places which were found to be successful. Based on this, Government of Tamil Nadu proposed a comprehensive package of doorstep services to ensure continuum of care and health care services and named as “Makkalai Thedi Maruthuvam (MTM)”. A systematic review on evidence and implications of community-based interventions on NCDs suggest, compared with standard care, community-based activities with primary health care workers have the potential to be more effective in LMICs, particularly for tobacco cessation, blood pressure and diabetes control.⁷ Similarly, MTM program gained much appreciations from the demand side, but the program managers claimed that they have to overcome many barriers for the effective implementation in the field. Not much studies were available on the evaluation and experiences of PBS and doorstep delivery of drugs. So, we conducted a qualitative study to understand the challenges encountered during the implementation of the community-based intervention – NCD-Makkalai Thedi Maruthuvam (MTM) to bring in course corrections for better outputs and outcomes.

METHODS

STUDY SETTING : Doorstep services under the MTM program are being implemented since August 2021 across Tamil Nadu for ensuring continuum of care and sustainability of health care services. The first is Population Based Screening (PBS) for those aged 18 years and above covering 10 common conditions - hypertension, diabetes, oral cancer, cervical cancer, breast cancer, Tuberculosis, Leprosy, Chronic Kidney Diseases, COPD and Mental Health. The screening is done by Women Health Volunteers (WHVs) who are identified from the community through Self Help Group network under another department, Tamil Nadu Women Development Corporation (TNCDW) and their works are recognised by paying them incentives based on fixed performance indicators. Second is doorstep delivery of antihypertensive and antidiabetic drugs by the WHVs to registered patients aged 45 years and above and to non-ambulatory patients.

The drugs for each patient should be packed at the facility by the PHC team - Pharmacist and MTM staff nurse, sealed and sent to HSCs for distribution by the WHVs with the appropriate details of the patients. The drugs are given for two months and on third month, patients should visit the facility for assessing their control status, doctors' opinion and any titration of drugs required.

Third service is the home-based palliative care services by Palliative Care Nurse for patients with chronic debilitating illness who have difficulty in visiting health facilities. The fourth service is the home-based physiotherapy services by Physiotherapists for elderly, home-bound patients and those with restricted mobility. The fifth is the delivery of peritoneal dialysis bags to chronic kidney diseases patients under Continuous Ambulatory Peritoneal Dialysis (CAPD) by the Palliative Care nurse. The treating team at medical colleges should make an indent, subject to the patient load and requirements for each patient and it should be delivered at block level by the supplier from where it reaches the patient through the palliative care nurse.

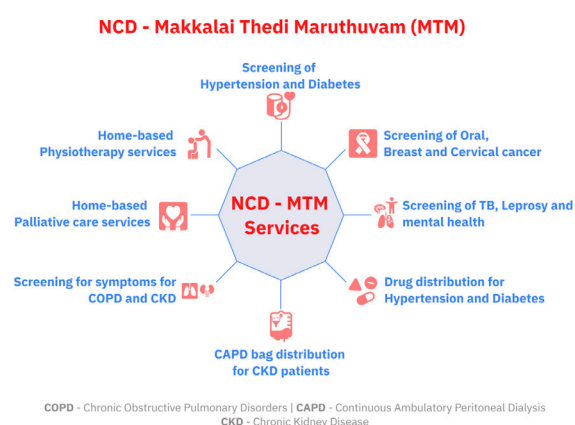


Figure 1 : Home based services under “Makkalai Thedi Maruthuvam” – community-based intervention for NCDs across Tamil Nadu, since August 2021

WHVs involved in PBS and drug delivery are engaged at the rate of one per Health Sub-centre with a population norm of 5000, and are provided with an incentive of Rs.4500/- per month based on performances and includes an allotment for their mobility support. The BP apparatus, Glucometer, and checklist for assessing risk factors and registers are provided and carried in a branded bag. NHM is responsible for procuring and supplying of equipment and logistics for the home-based screening. WHVs have an advanced tour program before every month for both screening and drug distribution. The Palliative care nurse and Physiotherapist are a team and are engaged as one team for one block and

are provided with a mobile outreach vehicle and they share a common tour program. The human resources involved were given training before the initiation of the program implementation. Existing field staff at block level and Primary Health Centre (PHC) team supports and supervises the program activities.

STUDY DESIGN AND STUDY POPULATION : We conducted a qualitative study in the month of October, 2022. We included stakeholders implementing the program at all levels. We reviewed all the program documents – protocol, implementation guidelines, daily and monthly reports. We collected the minutes of review meetings conducted periodically at PHC level by the MOs, by Deputy Directors of Health Services (DDHS) at districts and by the State program officials at state level.

SAMPLING METHOD : We selected 25 Women Health Volunteers (WHVs), 15 Mid-Level Health Provider (MLHPs), 5 Pharmacists, 10 MTM Nurses, 10 PHC Medical Officers (MOs), and 5 Block Medical Officers (BMOs), 10 District Program Officers for NCDs (DPO-NCD), and 10 DDHS at district level by purposive sampling, and 5 Officials from the State Directorate office and 5 Officials from National Health Mission (NHM) involved in NCD program and conducted in depth interviews.

DATA COLLECTION AND DATA ANALYSIS : We compiled the information abstracted from the program documents to record the implementation processes of the program and reviewed the work pattern of each of the human resource involved. The interviews were focused on areas understanding the challenges in implementation of the program. Interviews were conducted by selected district and state level officials from the system. An initial orientation session was conducted on doing in-depth interviews. We audio recorded the interview with consent, transcribed, generated codes, and did thematic analysis by free listing and pile sorting.

RESULTS

The challenges reported were grouped under seven thematic areas – human resources, screening for NCDs, referral linkages and follow-up, delivery of drugs, dialysis bags, reporting, monitoring and supervision, and IEC/BCC.

Human Resources :

MTM is a government flagship program and the entire PHC team is responsible for effective implementation but it became solely dependent on the works of WHVs. WHVs are recruited through TNCDW and do not come under the administrative control of Directorate of Public Health and it

was reported that WHVs cannot be held responsible for any deviations in field implementation.

Table 1: Challenges in field level implementation of “Makkalai Thedi MARuthuvam” – community-based interventions for NCDs in Tamil Nadu, 2021-22

Themes	Subthemes
Human Resources	Less and delayed payment of Incentives Lack of dedicated posts of Palliative care Nurse
Screening for NCDs	Visit timings of WHVs in working hours Poor acceptance and social issues Interrupted supply and no calibration procedure for equipment Less focus on screening for common cancers
Follow-up	No referral linkages Poor follow-up of suspected and referred Reluctance of HT, DM patients to visit facility for 3rd month follow-up
Delivery of drugs & dialysis bags	WHVs involved in drug packing WHVs travel to fetch the drug packs from PHCs Shortage of supply of dialysis bags
Reporting	Multiple reporting system Substantial amount of work time spent in reporting No linking of data across three levels of care Data duplication Data not available for follow-up and review
Monitoring and supervision	No real time monitoring using the data Lack of immediate level supervision No clarity on the guidelines issued Multiple review meetings for districts
IEC/BCC & Research	Need for IEC/BCC strategies planning and initiation Lack of funds for operational researches

WHVs reported that the incentives are very less. Also, incentives were disbursed using a complex process, wherein attendance and performance-based score were approved by PHC MO and sent to BMO. BMO compile for all PHCs in the Block and share to district office. DDHS at district level compile and send to district office of TNCDW where processed and finally direct transfer done to WHV account, causing an average delay of 15 days to 2 months. In few places, it is further delayed, when sent to approval of the District Collectors.

In addition to routine incentives, the WHVs engaged in Health & Wellness centers – Health Sub centers (HWC-HSCs), are eligible for Performance Based Incentives (PBI) under Universal Health Coverage (UHC), creating disparities among WHVs working in HWC and non-HWC HSCs. The revisioning of uniform incentives cannot be done since it is not modifiable as per Government of India norms. Another constant issue is high turnover rate of WHVs, and PHC team had to depend on TNCDW officials every time for replacement and often conducting training of the newly identified WHVs is also a challenge.

There is long term vacancy of about 79(17%) out of total 464 required Palliative care nurses. They are identified from the regular pool of nurses and trained on palliative care. Currently, there exists 25% of vacancy among the regular nurses including MTM nurses. So, attempts in filling the 17% of vacancy will cause additional burden of reallocating nurses from the regular pool.

Screening of the target individuals :

The main challenge in the screening at the doorsteps is the visit timing of the WHVs. As per the program guidelines, the WHVs should plan the screening schedule either before 9am or after 4pm and on Sundays, specific to availability of the households in their catering areas. Whereas it is not followed at many places and they visit during the day time between 9am to 5pm ending up with the non-availability of the household members. The working group are mostly remaining uncovered. Also, they have reported poor acceptance in urbanized areas and among APL population. Few WHVs reported social issues in rural areas hindering screening coverage. HSCs with more than 5000 population norms is a challenge especially in urban areas. There is also obscurity in planning the tour program of WHVs due to the vagueness in combining the drug distribution and screening plan.

BP apparatus and Glucometers used in the field show higher values and errors ending up in unnecessary referrals, public losing confidence in the skills of WHVs. Interrupted supply of consumables, frequent need for changing batteries for the equipment bring inconvenience and make WHVs fatigue, and at times they are ended up spending from their pockets.

Screening of common cancers with on early symptoms to all women aged 30 years and above, have lost focus amidst the biological screening for HT and DM and drug distribution services. Screening for TB, Leprosy, CKD, COPD and mental health are not taken up.

Referral linkages and Follow-up :

The target individuals when screened at households and referred, not all the individuals reach the facility for confirmation and many become dropouts. Referral slips were not used by WHVs resulting in uncertainty on the numbers reached and confirmed. Referral slips were not supplied in many of the facilities. No back referral mechanism available and tracing becomes difficult.

Patients receiving drugs at doorsteps demands continuous drug delivery by WHVs and showing reluctance to visit PHCs for the 3rd month follow-up which is important for assessing their control status and consultation with doctor. This remains a barrier in achieving the disease control.

Regular follow-up of HT & DM patients for complications and of screened positive individuals for cervical, breast cancer at facilities for further investigations are less focused and needs improvement.

Delivery of drugs :

Instead of PHC team transporting the drugs to HSCs, WHVs travel more than twice a week to fetch the packed drugs or sometimes directly involved even in packing the drugs. This disturbs WHVs routine plan and leads to following non-systematic way of covering villages for screening and drug delivery. Drug packs are brought back without distributing in more than half of the HSCs due to non-availability of beneficiaries during their daytime visit. Occasionally, some facilities are facing drug shortage which was informed as manageable when indenting of drugs are done consciously by PHC team considering the patient load and requirements.

Delivery of dialysis bags :

Delivery of bags at block level is not happening and often MTM team have to collect from the ware houses and deliver to the patient. Off and on, shortage in supply occurs and strong interdepartmental coordination is essential to ensure continuous supply.

Reporting :

Different modes of reporting from field to state viz paper-based reports, electronic reports in simple excel, google sheets, and web based reporting in three different portals – one developed exclusively for MTM program called MTM portal, another state Population Health Registry (PHR) portal and third is national portal. These multiple ways of reporting make all health staff stressful and substantial amount of their work time is spent on reporting. Excel and google sheets have the inherent issues of invalid entries, putting in more human resources to follow-up the entries and preparing reports from entries on daily basis for review. The program owned MTM portal is designed to collect only aggregate numbers for the services provided.

The state PHR portal allows unique ID generation for each individual and mapping them at village level. However, the line list cannot be generated at any level starting from health subcenter to state. The available reports in a dashboard are also not by institution wise and has synchronization issues reported which prevents usage of the information for review and course corrections by the institutions. Hence in addition to portal entry, separate manual reporting also collected for review purpose which again makes the staff fatigued. National portal also allows entry but reports are not generated for review purpose and thus remains less useful. The digital reports also have no link among the three levels of care, state portal is used only at primary level and national

app used on pilot mode at secondary and tertiary level, ending up in duplication of entries and not helpful for appropriate follow-up.

Monitoring and Supervision :

The poor reporting system also had closed the opportunities of real time monitoring of the program. The entire supervision network looks broken and uncoordinated. The immediate level supervision by Village Health Nurses (VHNs) equivalent to ANM in GoI norms, had not taken off due to poor understanding of the program. The other field staff were also not much focused on the process and unaware of where to render appropriate support from their part. The guidelines were meticulously drafted but was not communicated across the levels of care and hence stakeholders up to district level were unclear. Consequently, WHVs were involved in other activities of the PHC, were not rendered suitable support and supervision, and incoordination exists among different categories of field staff. In some areas, the engagement of MLHP under UHC at the sub-center level have created insecurity among the VHNs, the female cadre at HSCs considered as the backbone of public health, again leading to incoordination. On the other hand, the program is monitored by different departments. It was reported by district officials that multiple review meetings are conducted, sometimes repeating and sometimes with conflicting updates. As per the government orders, state level monitoring should be by the Directorate of Public Health through State NCD cell at NHM.

IEC/BCC and Research :

There is an overwhelming need for planning and initiation of Information, Education and Communication (IEC) and Behaviour Change Communication (BCC) strategies for public to understand the need for early screening for NCDs including common cancers, follow-up treatment, complications of Hypertension and diabetes, and treatment compliance. Primarily, it is important to impart IEC among MTM beneficiaries on the third month follow-up visits to facilities for want of doctor's consultation and evaluating their control status of HT and DM. Skipping these follow-up visits hinders achieving control. It was opined that though directorate of Public Health implementing the program have requisite human and technical resources to undertake short operational researches to decide on appropriate course corrections, there is lack of funding to materialize it.

Amidst the above challenges, NCD-MTM have enlarged extensively and lakhs of beneficiaries are being benefitted

under the program.

DISCUSSION

MTM was executed a year back and our study is the first one after the program initiation in Tamil Nadu. We did a qualitative study among the stakeholders across all levels of Primary health care starting from Health subcentre, PHC, Block, district and state. Our study had helped understanding core issues and hindrances that are affecting the implementation of the program. In the one-year implementation of the program with its comprehensive package of services, it had gained a wider recognition by the public. Similar program in underserved rural areas of Brazil with an education and medical interventions had shown improvement on the control rates of HT and DM.⁸ Such community-based interventions involving the primary health care staff have proved cost effective.⁹ Studied have proven the necessity and success of NCD intervention services at community by primary care health workers.¹⁰⁻¹³

By design, MTM implementation became solely dependent on WHVs belonging to another department. Less incentives with considerable delay in disbursement every month, and disparities based on the position of WHVs at HWC HSCs or non HWC HSCs due to PBI under UHC are demotivating the interests of WHVs.

Home-based palliative care component is dependent on Palliative care nurse which again functions on diverting nurses from the existing routine pool, questioning the sustainability of delivery of services. Working population, urban areas and areas with more than the population norms were reported to have poor screening coverage.

Calibration of the equipment used in the field and frequent changing of batteries are necessary. Drug distribution and screening schedule are not planned in accordance. Screening of common cancers needs much more focus and improvement.

There is poor follow-up of those suspected and referred for diagnosis, those confirmed on compliance of treatment, complications and control. The referral mechanism lacks linkages and no coordination in tracing the dropouts. Patients those receiving drugs at doorsteps are not aware of the importance of their third month follow-up visit to facility which is vital for achieving control. The delivery of drugs by WHVs and of CAPD bags by palliative care nurse lacks coordination and support from other field staff.

Multiple reporting system burdens the staff and prevents them from focusing on the delivery of services. The reports from different web-based portals are not available for the program managers in districts and PHCs to use for real time

monitoring and supervision and in turn affecting them in holding the program. The stakeholders at district, PHC level needs clarity on the guidelines and instructions issued so far to understand the processes of the program. Even though NCD program had been more than a decade, it is required to adopt more IEC strategies to bring awareness among the public for demand generation and no funds were allotted for the IEC activities. Small operational researches should be undertaken to realize the needs for any improvement in the program implementation. Experiences on community-based NCD interventions from developed countries have suggested similar recommendations for sustainable and effective implementation like well-planned media and communication messages, a reliable monitoring and evaluations system, and dissemination of the evaluation and experiences to have a broader impact.¹⁴ Digital transformation of the public health sector must be accelerated to create an efficient and sustainable predict-prevent healthcare system.¹⁵

LIMITATIONS

Data were collected by health system personnel and so WHVs, nurses and MOs would not have revealed all the challenges faced by them.

RECOMMENDATIONS

MTM implementation is the responsibility of entire PHC team and not only WHVs. Reorientation of all WHVs and field level primary care staff along with PHC team - MOs, MTM SN, Pharmacists, Lab Technicians on the instructions and guidelines with clarity, enabling them to work as a team rendering appropriate support to each other and to execute their roles and responsibilities in delivering the MTM services.

Plan different screening strategies on outreach mode – camps by PHC team, by private hospitals empanelled under government insurance scheme, by NGOs and Welfare associations, camps at industries covering working population to improve screening coverage. Sensitize urban and ALP population on services of MTM to improve their acceptance.

A buffer stock of BP apparatus, Glucometers to be consistently maintained at district/ block level for immediate replacement of equipment with issues. Orientation of WHVs on planning screening and drug distribution based on their patient load under the guidance of the PHC MO for systematic coverage of villages.

Strategies refocussing on institutional screening of cancers, and follow-up of NCD patients for compliance

and control. All districts to have an operational continuous district/ Block level training plan to train the fresh recruits and refresher training to all staff categories.

Until the development of an effective IT tool, to meet the current needs, manual forms and registers are to be supplied and consider initiating a mechanism of collating existing manual reports to improve follow-up services, to minimize dropouts for confirmation services and to improve patients' compliance to treatment. State should seriously take immediate measures to adopt an operative and effective reporting system that allows easy access in entering data and allows real-time dynamic flow of information across levels of care ensuring early interventions in management of NCDs. System should not ignore commencing efforts to design and disseminate IEC messages which improves demand generation and utilization of services provided. Funding support from National Health Mission (NHM) and Tamil Nadu Health System Reforms Project (TNHSRP) to directorate of Public Health to conduct studies on evaluating the process and output of the program and applying the results for bringing in required course corrections and to develop IEC/BCC strategies.

NCD-MTM is a first of its kind in the country and rectifying the reported challenges with appropriate solutions will make this program a successful model and will help in bringing desirable NCD outcomes.

CONFLICT OF INTEREST : Nil

REFERENCES

1. Non communicable diseases [Internet]. [cited 2023 Jan 10]. Available from: <https://www.who.int/news-room/fact-sheets/detail/noncommunicable-diseases>
2. Mohanty SK, Rodgers J, Singh RR, Mishra RS, Kim R, Khan J, et al. Morbidity compression or expansion? A temporal analysis of the age at onset of non-communicable diseases in India. *GeroScience*. 2021 Feb;43(1):409–22.
3. WHO STEPS Survey - Tamil Nadu. Tamil Nadu Health Systems Reforms Project; 2022.
4. Strategy for Prevention and Management of Non Communicable Diseases. Health & Family Welfare Department, Government of Tamil Nadu;
5. Implementation Status & Results Report - India: Tamil Nadu Health Systems Project (P075058). The World Bank;

2015.

6. National Programme for prevention & Control of Cancer, Diabetes, Cardiovascular Diseases & stroke (NPCDCS) :: National Health Mission [Internet]. [cited 2023 Jan 9]. Available from: <https://nhm.gov.in/index1.php?lang=1&level=2&sublinkid=1048&lid=604>

7. Jeet G, Thakur JS, Prinja S, Singh M. Community health workers for non-communicable diseases prevention and control in developing countries: Evidence and implications. Maulik PK, editor. PLOS ONE. 2017 Jul 13;12(7):e0180640.

8. Lemos Macedo JC, de Carvalho VCH dos S, Cortes TBA, Soares DA, Mistro S, Kochergin CN, et al. Community-Based Interventions to Improve the Control of Non-Communicable Diseases in Underserved Rural Areas in Brazil: A Before-and-After Study. *Front Pharmacol*. 2021 Apr 14;12:644599.

9. Kaur G, Chauhan AS, Prinja S, Teerawattananon Y, Muniyandi M, Rastogi A, et al. Cost-effectiveness of population-based screening for diabetes and hypertension in India: an economic modelling study. *Lancet Public Health*. 2022 Jan;7(1):e65–73.

10. Sujarwoto, Maharani A. Participation in community-based healthcare interventions and non-communicable diseases early detection of general population in Indonesia.

SSM - Popul Health. 2022 Sep;19:101236.

11. Akutey R, Der R, Owusu-Daaku F, Baiden F. Using community pharmacies to expand access to screening for noncommunicable diseases in suburban Ghana-A facility-based survey on client needs and acceptability. *Health Sci Rep*. 2018 Jul 30;e79.

12. Mishra SR, Neupane D, Bhandari PM, Khanal V, Kallestrup P. Burgeoning burden of non-communicable diseases in Nepal: a scoping review. *Glob Health*. 2015 Dec;11(1):32.

13. Pati MK, Swaroop N, Kar A, Aggarwal P, Jayanna K, Van Damme W. A narrative review of gaps in the provision of integrated care for noncommunicable diseases in India. *Public Health Rev*. 2020 Dec;41(1):8.

14. Nissinen A, Berrios X, Puska P. Community-based noncommunicable disease interventions: lessons from developed countries for developing ones. *Bull World Health Organ*. 2001;

15. Canfell OJ, Kodiyattu Z, Eakin E, Burton-Jones A, Wong I, Macaulay C, et al. Real-world data for precision public health of noncommunicable diseases: a scoping review. *BMC Public Health*. 2022 Nov 24;22(1):2166.

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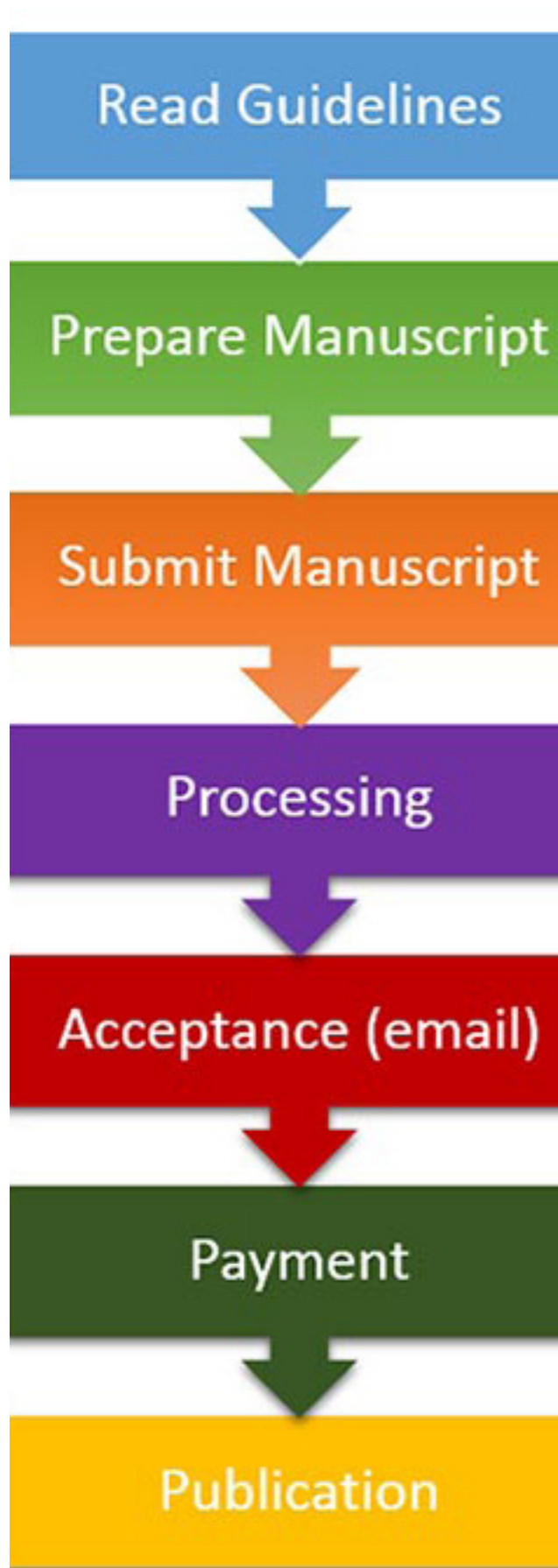
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